The PHOTOFACT Servicer

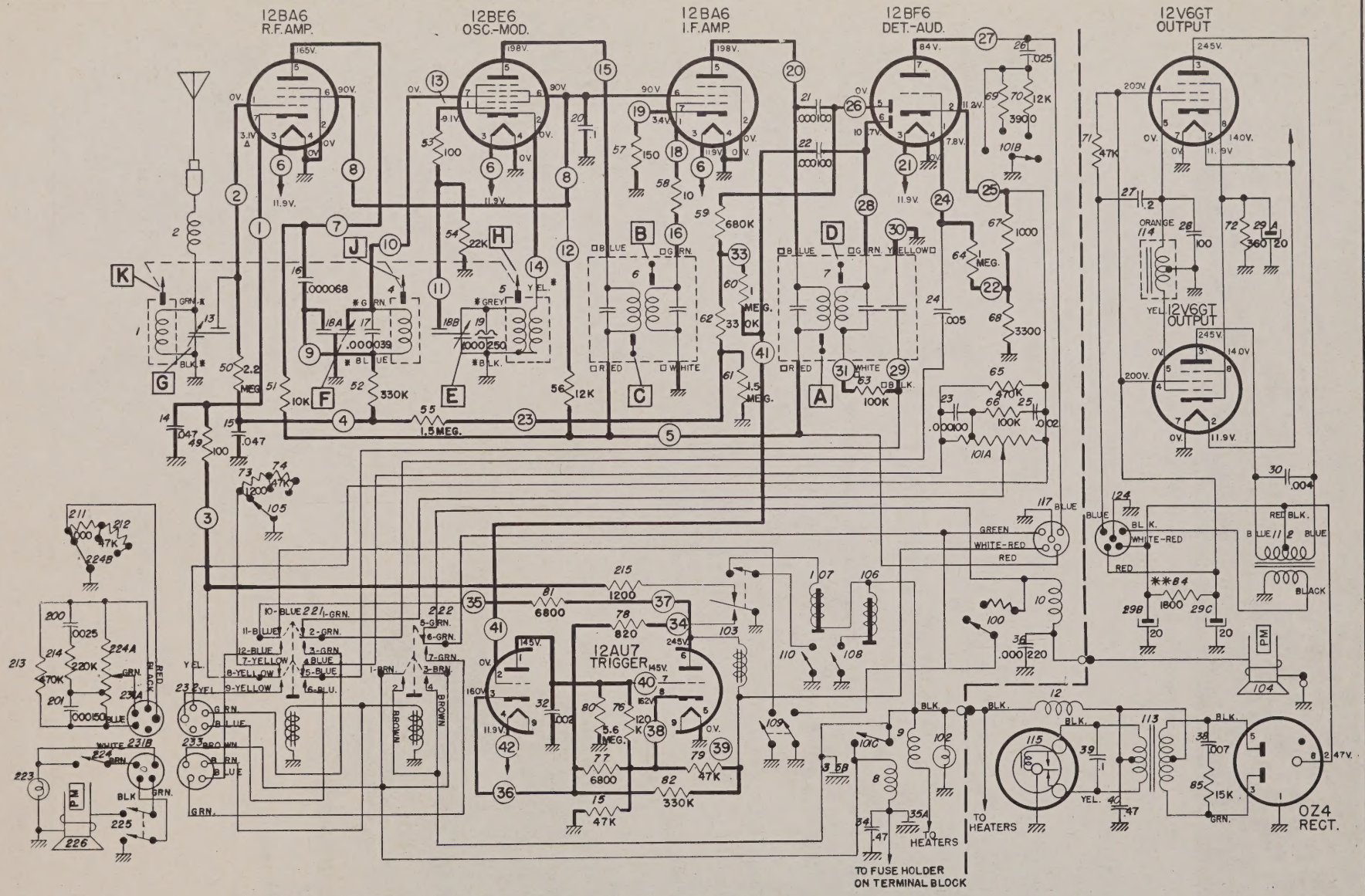
SET 397 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ MAY 1, 1958

CONTENTS-- PHOTOFACT SET 397

TRADE NAME AND MODEL	SET AND FOLDER NO.
TELEVISION RECEIVERS	
ADMIRAL	
B1A21F1, B121F1, C21F42, 43, 46, 48, CA21F42, 43, T21F32, 33, TA21F32, 33 (Ch. 17AC1, 17AG1, 17C1, B, 17G1, B)	397-1
OLYMPIC	
CD108, U, CD109, U, CD110P, PU, CH402, U, KD118, U, KD119, U, KD120, U, KH406, U, KH407, U, TD102, U (Ch. GD, GDU, GH, GHU)	397-2
SILVERTONE	
8114, B, 8115, 16, 17, 54, 55, 56, 57, 58, 60, 61, 62, 63, 82, 83, 84, 85, 86, 87, 88, 96, 97, 98, 99 (Ch. 528.51106, 107, 108, 160, 161, 163, 164, 165, 166, 167, 168, 170, 171, 172, 173, 175, 180, 181, 182, 183, 184, 185, 187, 190, 191, 193, 194, 240, 241, 242, 245, 250, 251, 253)	397-3
PRODUCTION CHANGE BULLETIN	
MOTOROLA Television Rec.	
Chassis MTS-537, Y, PTS-537, Y, QTS-537, Y, TS-537, Y, TTS-537, Y, WTS-537, Y	397-4
OTHER EQUIPMENT	
BECKER	
"Europa" MU, MUK	397-5
BELL SOUND	
2315	397-6
DAVID BOGEN	
LX60	397-7
LAFAYETTE	
LA-69	397-8
PACEMAKER	
PM 20	397-9
RCA VICTOR Tape Recorder	
8TR2, 8TR3 (Ch. RS-156F, H, TR-2A-1, TR-2A-2)	397-10
REGENCY	
RC-103	397-11
SILVERTONE	
8017A, 8018A, 8019, 8020 (Ch. 528.53030, 528.53200)	397-12
SONIC	
410	397-13
STEELMAN	
3S8	397-14
4A21, 4A22	397-15
TRUETONE	
D5842A, D5844A	397-16
D5892, D5892A, D5894A	397-17
ZENITH	
A512W, A512Y (Ch. 5A02)	397-18

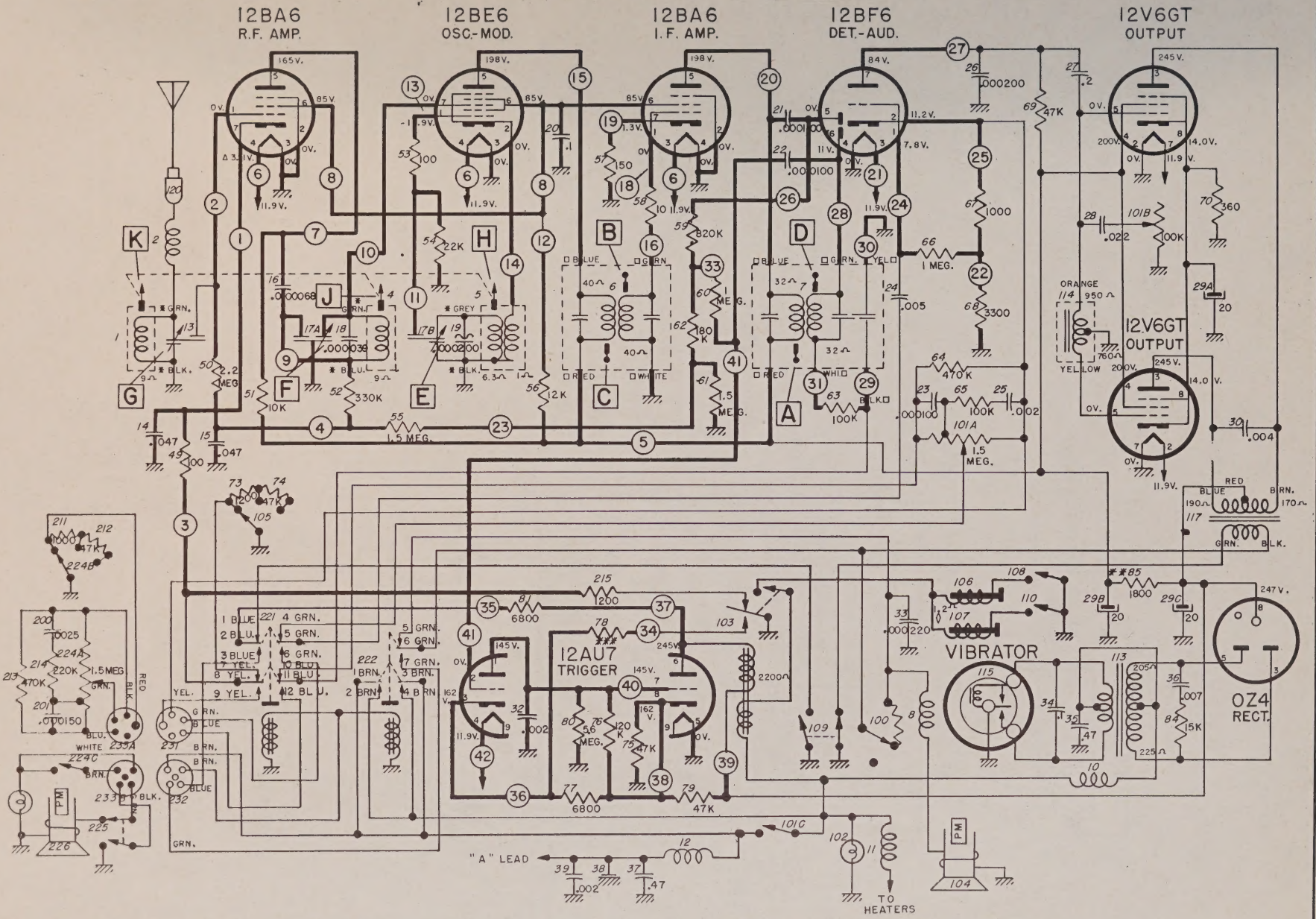
The service information in this Servicer provides data on models which we have been unable to present in PHOTOFACT Folders. The receivers are not in current production; a requirement for PHOTOFACT coverage, and we are therefore presenting schematics and supplementary data that will be of assistance when servicing these models.

SCHEMATIC DIAGRAM COURTESY DELCO RADIO DIV., GENERAL MOTORS CORP.



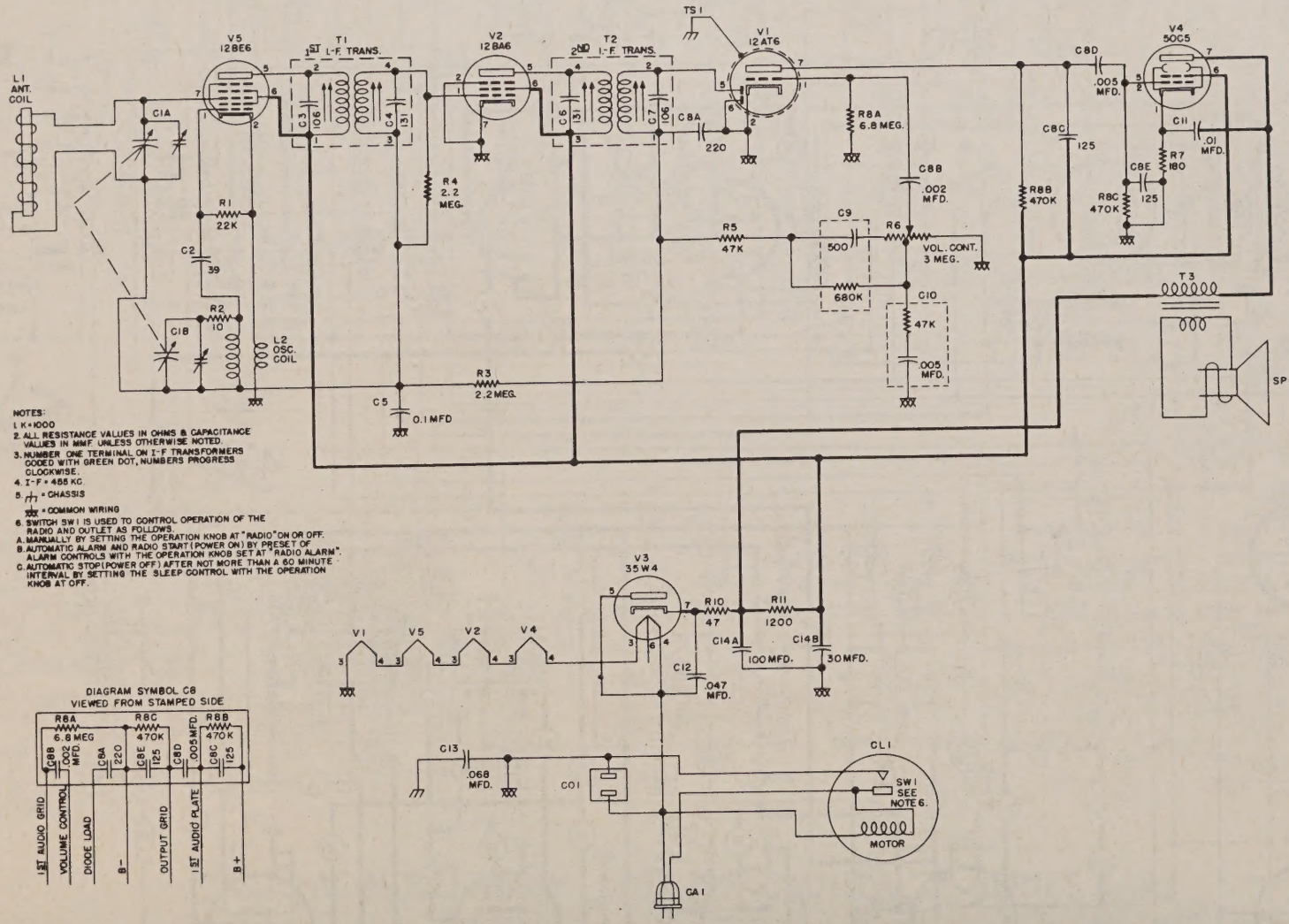
CADILLAC MODEL7268065, FOR 1957 CADILLAC 75 SERIES CARS

SCHEMATIC DIAGRAM COURTESY DELCO RADIO DIV., GENERAL MOTORS CORP.



CADILLAC MODEL 7270625, FOR 1958 CADILLAC 75 SERIES CARS

CROSLEY MODELS F-25BN, F-25BE, F-25BK, F-25GN (CHASSIS 25F)



NOTES:
1. K=1000
2. ALL RESISTANCE VALUES IN OHMS & CAPACITANCE VALUES IN MMF. UNLESS OTHERWISE NOTED.
3. NUMBER ONE TERMINAL ON I-F TRANSFORMERS CODED WITH GREEN DOT, NUMBERS PROGRESS CLOCKWISE.
4. I-F = 455 KC.
5. ⏚ = CHASSIS
   ⏚ = COMMON WIRING
6. SWITCH SW1 IS USED TO CONTROL OPERATION OF THE RADIO AND OUTLET AS FOLLOWS.
   A. MANUALLY BY SETTING THE OPERATION KNOB AT "RADIO" ON OR OFF.
   B. AUTOMATIC ALARM AND RADIO START (POWER ON) BY PRESET OF ALARM CONTROLS WITH THE OPERATION KNOB SET AT "RADIO ALARM".
   C. AUTOMATIC STOP (POWER OFF) AFTER NOT MORE THAN A 60 MINUTE INTERVAL BY SETTING THE SLEEP CONTROL WITH THE OPERATION KNOB AT OFF.

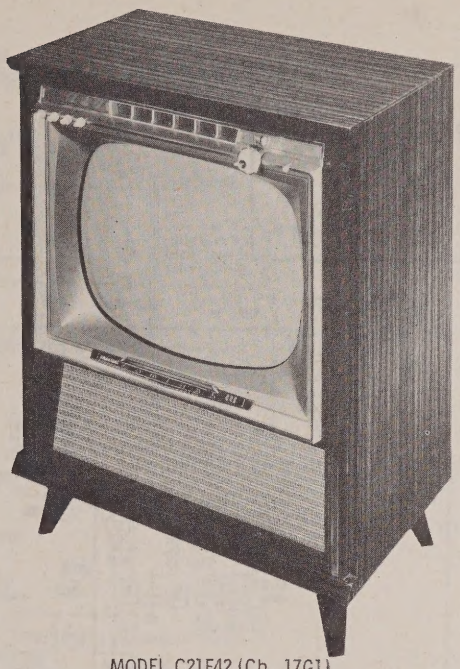
DIAGRAM SYMBOL C8
VIEWED FROM STAMPED SIDE

SCHEMATIC DIAGRAM COURTESY CROSLEY DIV. AVCO MFG. CORP.

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Release 9 spring clips and remove the rear cover.
2. Remove speaker leads.
3. Remove 4 metal screws from the 2 side chassis rails.
4. Remove 1 chassis bolt from the bottom bracket.
5. Remove the chassis from the front of the cabinet.



MODEL C21F42 (Ch. 17G1)

TRADE NAME	Admiral	MODELS	CHASSIS
		TA21F32, TA21F33	17AC1
		B1A21F1, CA21F42, CA21F43	17AG1
		T21F32, T21F33	17C1
			17C1B
		B121F1, C21F42, C21F43, C21F46, C21F48	17G1
			17G1B
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Illinois		
TYPE SET	Television Receiver		
TUBES	Seventeen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 200 Watts, 1.8 Amp. @ 117 Volts AC		
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. The adjustments are accessible, one at a time, as the channel selector is rotated. Adjust from the lowest to the highest channel operating in the area. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove bottom name plate with a non-metallic tool. Remove 2 screws from bracket at bottom of safety glass. Tilt glass out at the bottom and lower to remove.

SPECIAL ADJUSTMENTS

A. Super Range Finder
Tune in the strongest TV station operating in the area. Adjust controls for a normal picture. Turn the super range finder control fully counter clockwise, then clockwise approximately 1/2 turn. If picture becomes unstable, back off the control setting until stable. Check operation on all channels in the area.

B. Focus
The focus may be varied in steps by the position of a plug in the focus adjustment board.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

The horizontal frequency coil is used as the horizontal lock. Adjust the horizontal lock until the picture synchronizes horizontally. (For location, see tube placement chart.)

FUSES

One fuse is used for LV power supply protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

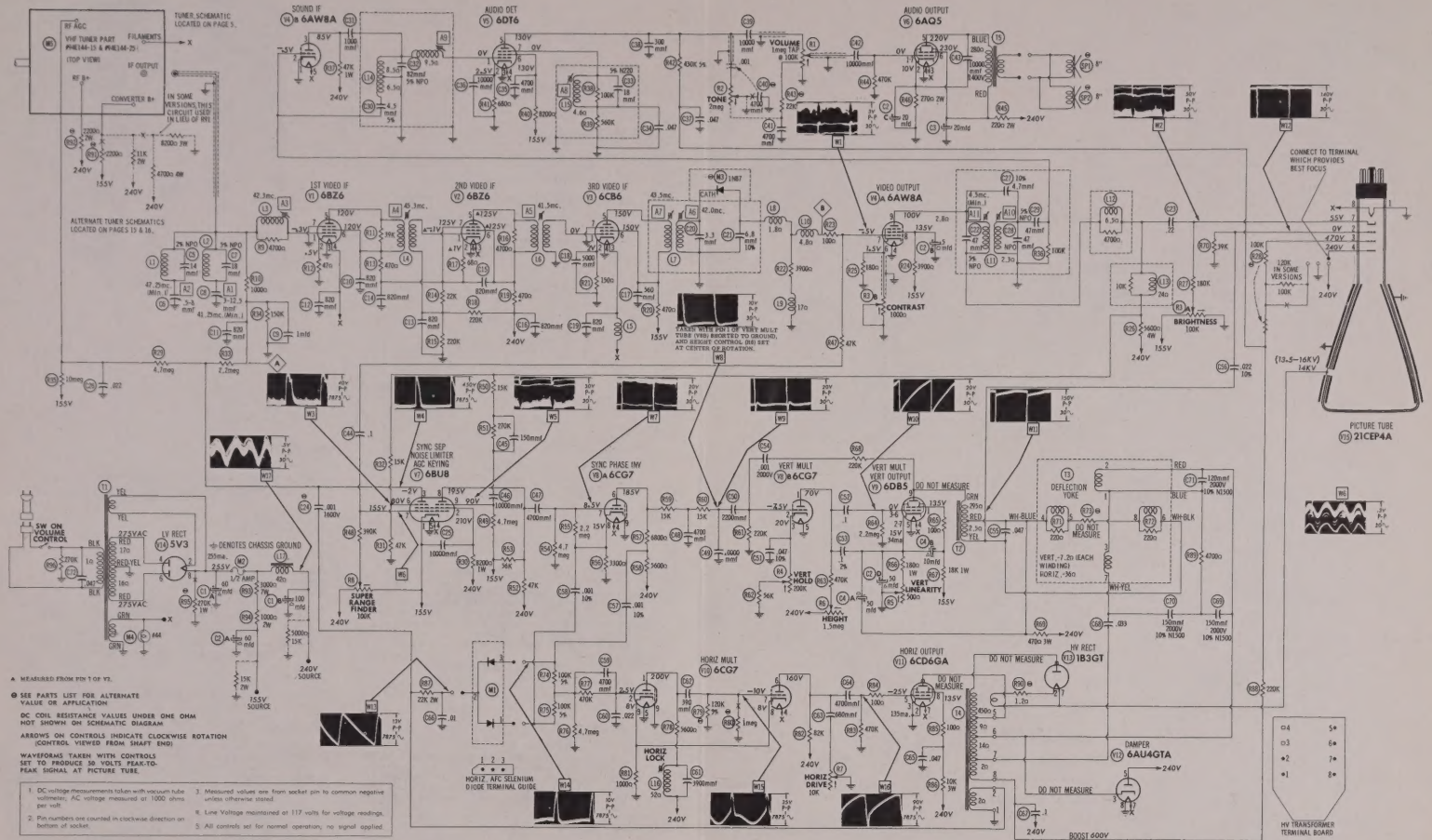
ADMIRAL CHASSIS 17AC1, 17AG1, 17C1, B, 17G1, B

SET 397 FOLDER 1

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of H438

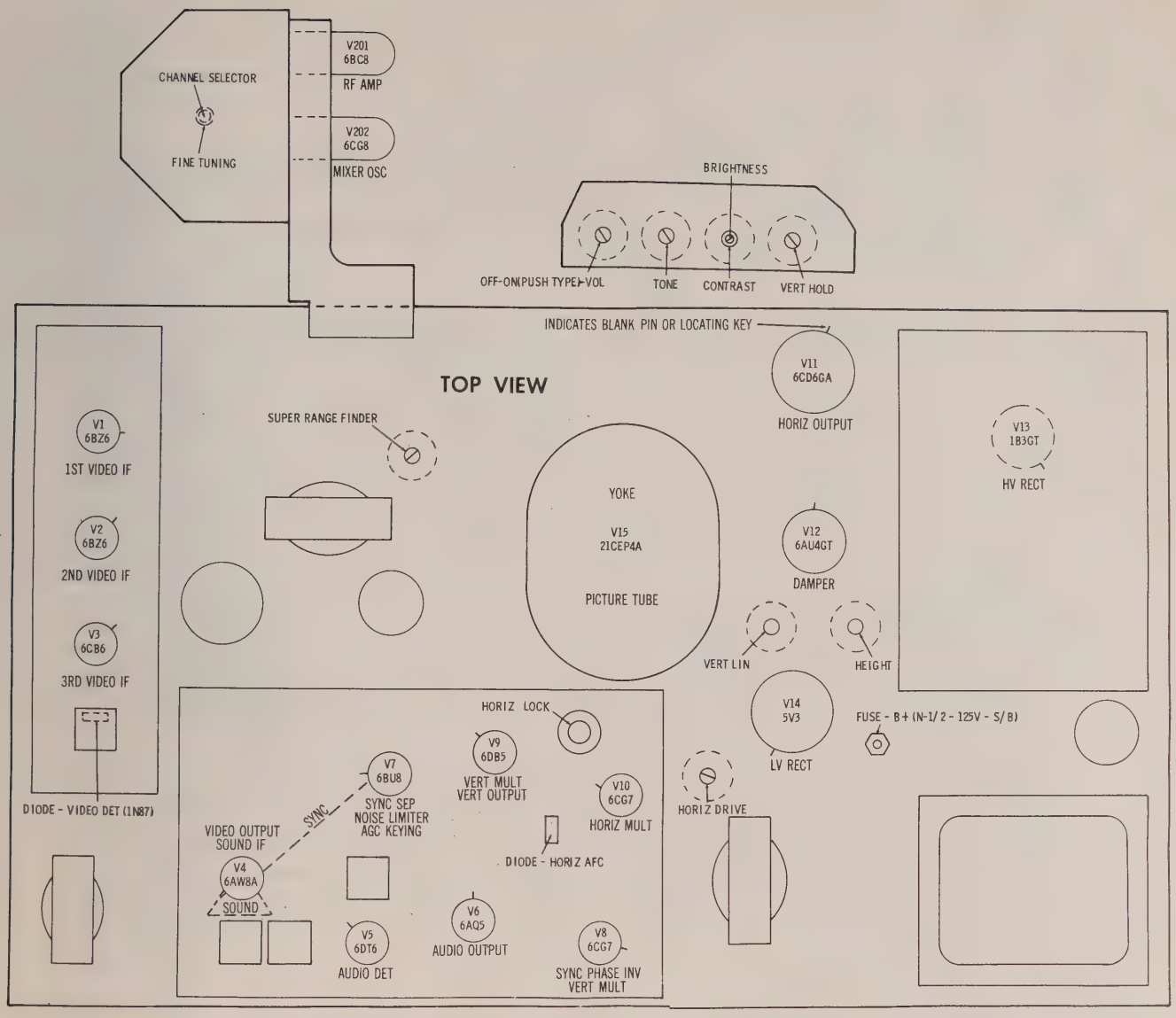
the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America


SOUND IF V4 6AW8A
AUDIO DET V5 6DT6
AUDIO OUTPUT V6 6AQ5
1ST VIDEO IF V1 6BZ6
2ND VIDEO IF V2 6BZ6
3RD VIDEO IF V3 6CB6
VIDEO OUTPUT V4 6AW8A
SYNC SEP NOISE LIMITER AGC KEYING V7 6BU8
SYNC PHASE INV V8 6CG7
VERT MULT V10 6CG7
VERT MULT VERT OUTPUT V9 6DB5
HORIZ MULT V16 6CG7
HORIZ OUTPUT V11 6CD6GA
HV RECT V13 1B3GT
DAMPER V12 6AU4GTA
LV RECT V14 5V3
PICTURE TUBE V15 21CEP4A
TUNER SCHEMATIC LOCATED ON PAGE 5.
ALTERNATE TUNER SCHEMATICS LOCATED ON PAGES 13 & 16.
CONNECT TO TERMINAL WHICH PROVIDES BEST FOCUS
CONTRAST
BRIGHTNESS
VOLUME
TONE
HEIGHT
VERT LINEARITY
VERT HOLD
HORIZ LOCK
HORIZ DRIVE
SUPER RANGE FINDER
SW ON VOLUME CONTROL
DEFLECTION YOKE
DO NOT MEASURE
BOOST 600V
HV TRANSFORMER TERMINAL BOARD
HORIZ AFC SELENIUM DIODE TERMINAL GUIDE
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

ADMIRAL CHASSIS 17AC1, 17AG1, 17C1, B, 17G1, B

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **Fuse (M2), V14**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V1, V2, V3, Diode (M3), V4**
No pic, no sound, has snow - **V201, V202, V1**
No pic, has sound, has raster - **V4, V15**
Has pic, no sound - **V4, V5, V6**
Overloaded picture - **V7**

SYNC FAILURE
No vert. sync - **V7, V8**
No horiz. sync - **V7, V8, Rectifier (M1)**
No vert. or horiz. sync - **V7, V8**

SWEEP FAILURE
No raster, has sound - **M1, V10, V11, V12, V13, V15**
No vertical deflection - **V8, V9**
Poor vert. linearity or foldover - **V8, V9**
Poor horiz. linearity or foldover - **V10, V11, V12**
Narrow picture - **V10, V11, V12**
Vert. off freq. - **V8, V9**
Horiz. off freq. - **V10**

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VIDEO IF ALIGNMENT

Remove the mixer-osc. tube (V202) and replace with one having the oscillator grid pin removed.
Disconnect the antenna and connect a short across the terminals.
Turn the contrast control fully counter clockwise.
Connect the negative lead of a 3 volt bias supply to point (A). Positive to chassis.
For steps 1 and 2 use a high signal generator output but for other steps, use only enough generator output to provide usable indication on the VTVM. Use lowest scale on VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over mixer-osc. tube (V202). Low side to chassis.	41.25MC (Unmod)	Any non-interfering channel	DC probe thru 10K to point (B). Common to chassis. (Across video det. load).	A1	Adjust for MINIMUM deflection.
2.	"	"	47.25MC	"	"	A2	"
3.	"	"	42.3MC	"	"	A3	Adjust for maximum deflection.
4.	"	"	45.3MC	"	"	Mixer Plate Coil	"
5.	"	"	45.3MC	"	"	A4	"
6.	"	"	41.5MC	"	"	A5	"
7.	"	"	42.0MC	"	"	A6	"
8.	"	"	43.5MC	"	"	A7	"

OVERALL VIDEO IF RESPONSE CHECK

Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Direct	High side to ungrounded tube shield floating over mixer-osc. tube (V202). Low side to chassis.	44.0MC (10MC Swp)	41.25MC 42.5MC 45.75MC 47.25MC	Any non-interfering channel	Vert. Amp. thru 10K to point (B). Low side to chassis.		Check for response similar to Fig. 1. If necessary, SLIGHTLY retouch A3 thru A7 for desired response.

SOUND IF ALIGNMENT

1. Turn the set on and tune in the strongest TV station signal in the area. Set all controls for normal operation.
2. Using a non-metallic hexagonal alignment tool, turn A8 very slowly clockwise until a buzz is heard in the sound. Then turn counter clockwise until loudest and clearest sound is heard. There may be two points at which the sound is loud, (approximately $\frac{1}{2}$ turn apart). The slug should be set at the center of the second point of loud sound as the slug is turned clockwise.
3. Using an attenuator or similar device, reduce the signal strength until a considerable amount of hiss is heard in the sound similar to super regeneration. The signal may also be reduced by disconnecting the antenna lead and placing it near the terminals.
4. Carefully adjust A9 for maximum undistorted sound and MINIMUM hiss. If the hiss disappears during alignment, further reduce the signal level until the hiss returns.
5. Carefully adjust A10 for maximum undistorted sound and MINIMUM hiss. No further adjustment of the sound IF section should be necessary if this alignment has been carefully made. However, if the sound is still distorted and noisy, repeat the entire alignment procedure.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.01mfd	High side to point (B). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	AC probe to pin 7 (cathode) of picture tube. Common to chassis.	A11	Adjust for MINIMUM deflection.

4.5MC TRAP ALIGNMENT USING ON THE AIR SIGNAL

Tune in a strong station and adjust the fine tuning until a beat pattern appears in the picture. Adjust A11 for MINIMUM beat pattern while observing the picture.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 6.

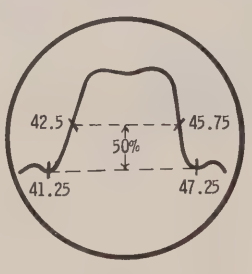
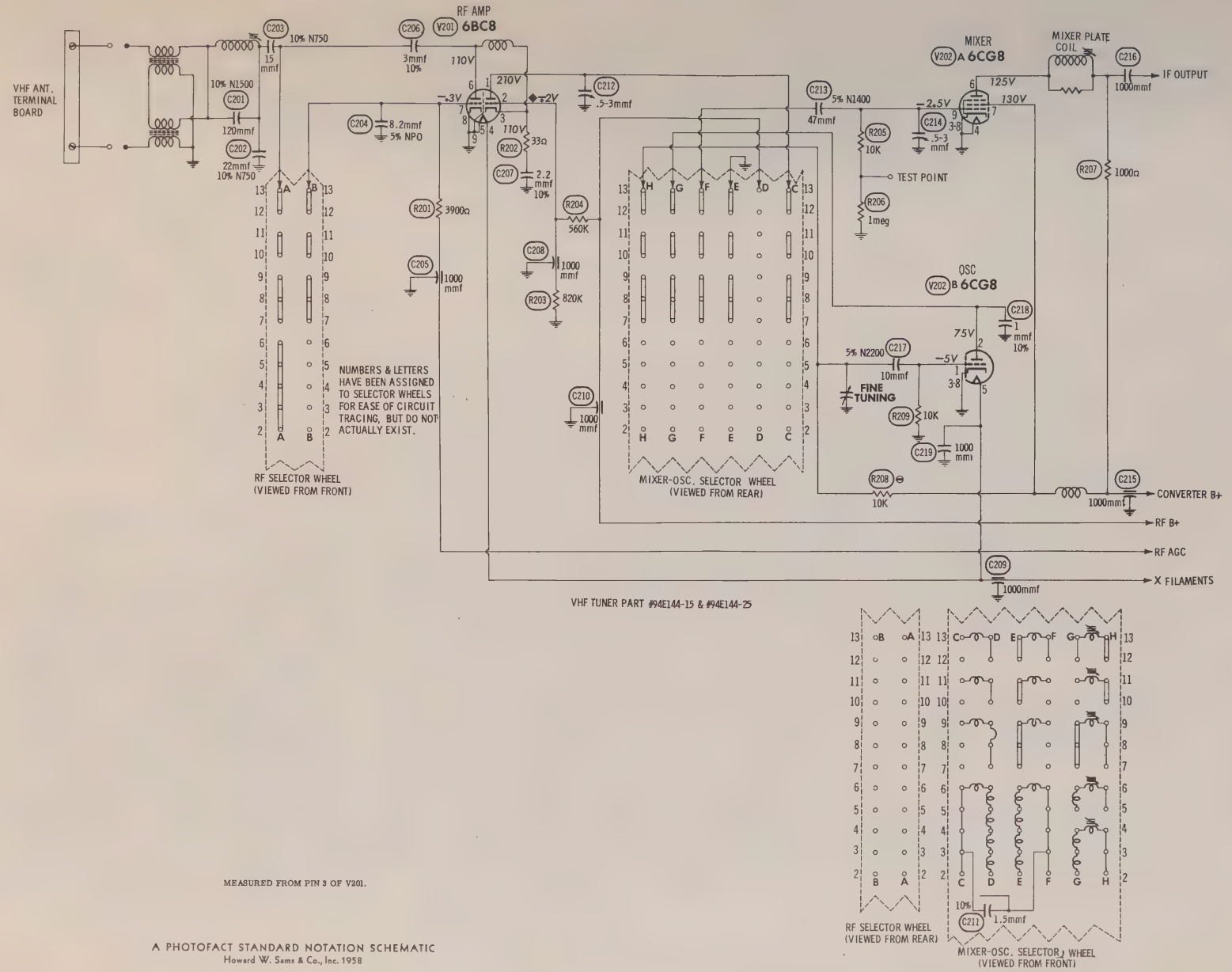


FIG. 1



A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

TUNER SCHEMATIC

ADMIRAL CHASSIS 17AC1, 17AG1, 17C1, B, 17G1, B

TUNER PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	6BC8	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	6CG8	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	120		65D10-136							N1500 10%
C202	22		65D10-134	N750-DI 22	TCN-22	C10Q22U	TC7-22		5TCU-Q22	N750 10%
C203	15		65D10-135	N750-DI 15	TCN-15	C10Q15U	TC7-15		5TCU-Q15	N750 10%
C204	8.2		65D10-131	NPO-SI 8.2		C10V82C	TCO-8.2			NPO 5%
C205	1000		65B26-5	EF-001	MFT-1000				503C-D1	
C206	3		65B28-030	NPO-SI 3.0		C10V3C	TCO-3.0			10%
C207	2.2		65D10-27	NPO-SI 2.2	TCZ-2R2	C10V22C	TCO-2.2		5TCCB-V22	10%
C208	1000		65B26-5	EF-001	MFT-1000				503C-D1	
C209	1000		65B26-5	EF-001	MFT-1000				503C-D1	
C210	1000		65B26-5	EF-001	MFT-1000				503C-D1	
C211	1.5		65B28-015	NPO-SI 1.5	TCZ-1R5	C10V15C	TCO-1.5	ZT-5515	5TCCB-V15	10%
C212	.5-3		66A38-6		829-3		3115-D	CT565A		
C213	47		65D10-73							N1400 5%
C214	.5-3		66A38-6		829-3		3115-D	CT565A		
C215	1000		65B26-5	EF-001	MFT-1000				503C-D1	
C216	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C217	10		65D10-160							N2200 5%
C218	1		65B28-010							10%
C219	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		ADMIRAL PART No.	NOTES
	OHMS	WATT		
R201	3900Ω		60B8-392	
R202	33Ω		60B8-330	
R203	820K		60B8-824	
R204	560K		60B8-564	
R205	10K		60B8-103	

ITEM No.	RATING		ADMIRAL PART No.	NOTES
	OHMS	WATT		
R206	1meg		60B8-105	
R207	1000Ω		60B8-102	
R208	10K		60B8-103	Note 1
R209	10K		60B8-103	

Note 1. Some versions may use 22K (Part #60B8-223) in this application.

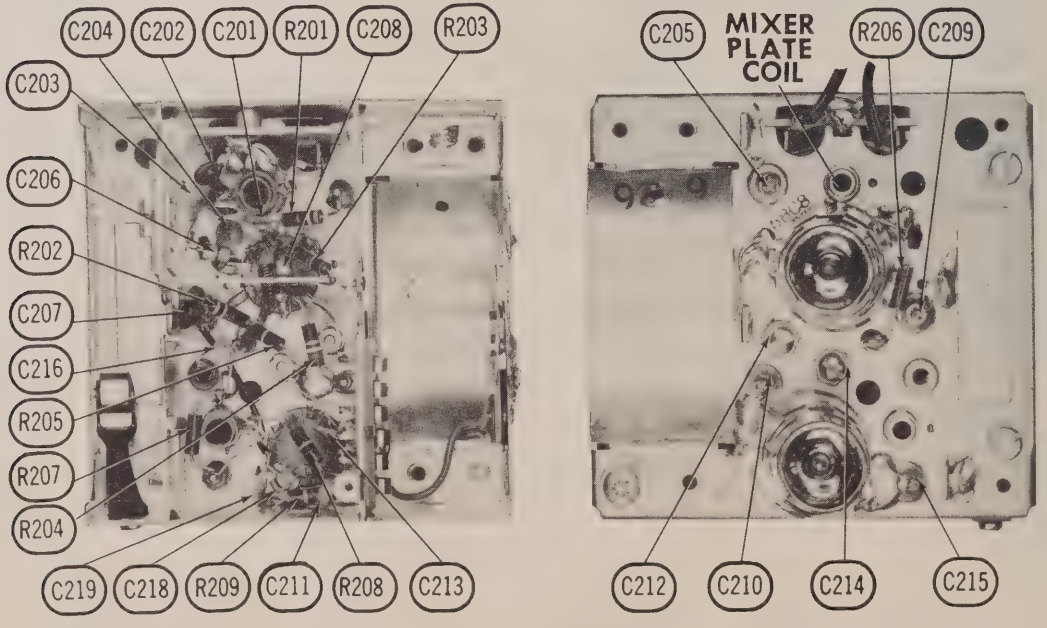
TUNER ALIGNMENT INSTRUCTIONS

VHF OSCILLATOR ALIGNMENT

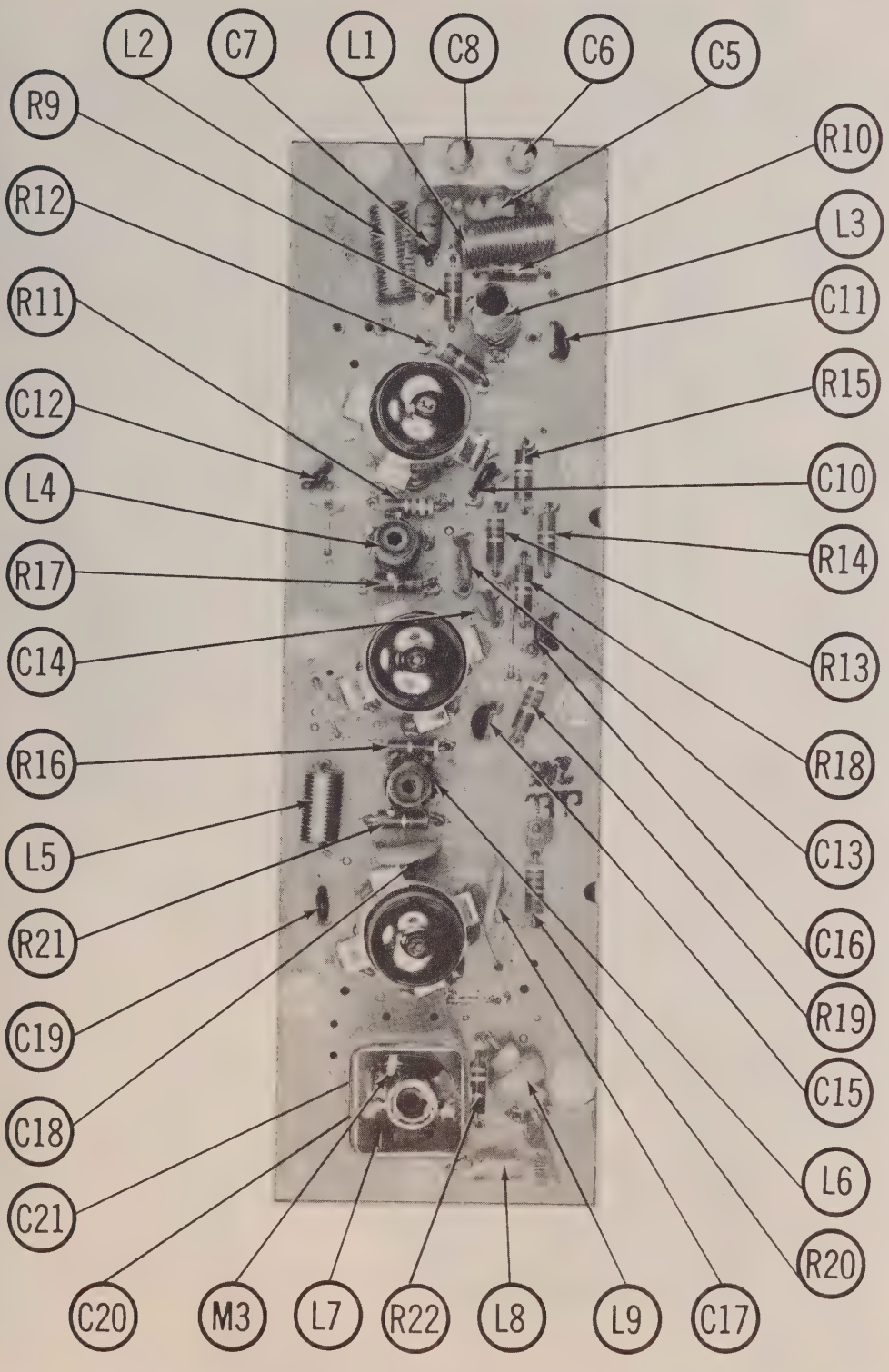
Turn the set on and allow 15 to 20 minutes warm-up period.
1. Set channel selector to the lowest channel operating in the area.
2. Set the fine tuning to the center of its range by turning two turns either way, then back 1/4 turn.
3. Set other controls for normal picture and sound.
4. Using a 1/8" non-metallic alignment tool, carefully adjust the oscillator slug for best picture and sound. NOTE: This is not necessarily the point of loudest sound. If two slugs are visible at the front of the tuner, adjust the one nearest the top of the tuner chassis. Repeat this procedure for the remaining stations, adjusting them in order of the channel number from the lowest to the highest.

RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

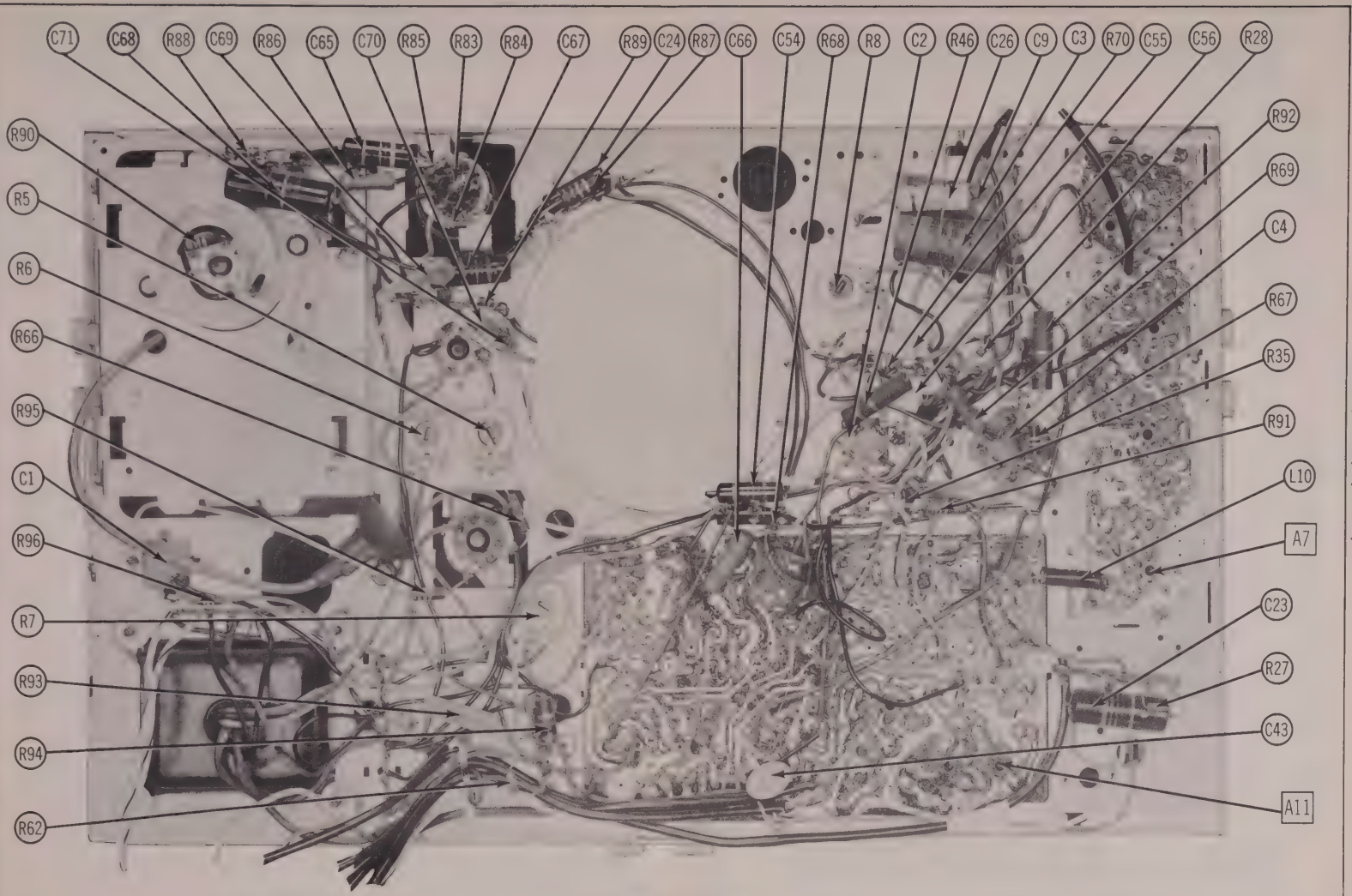


RF TUNER

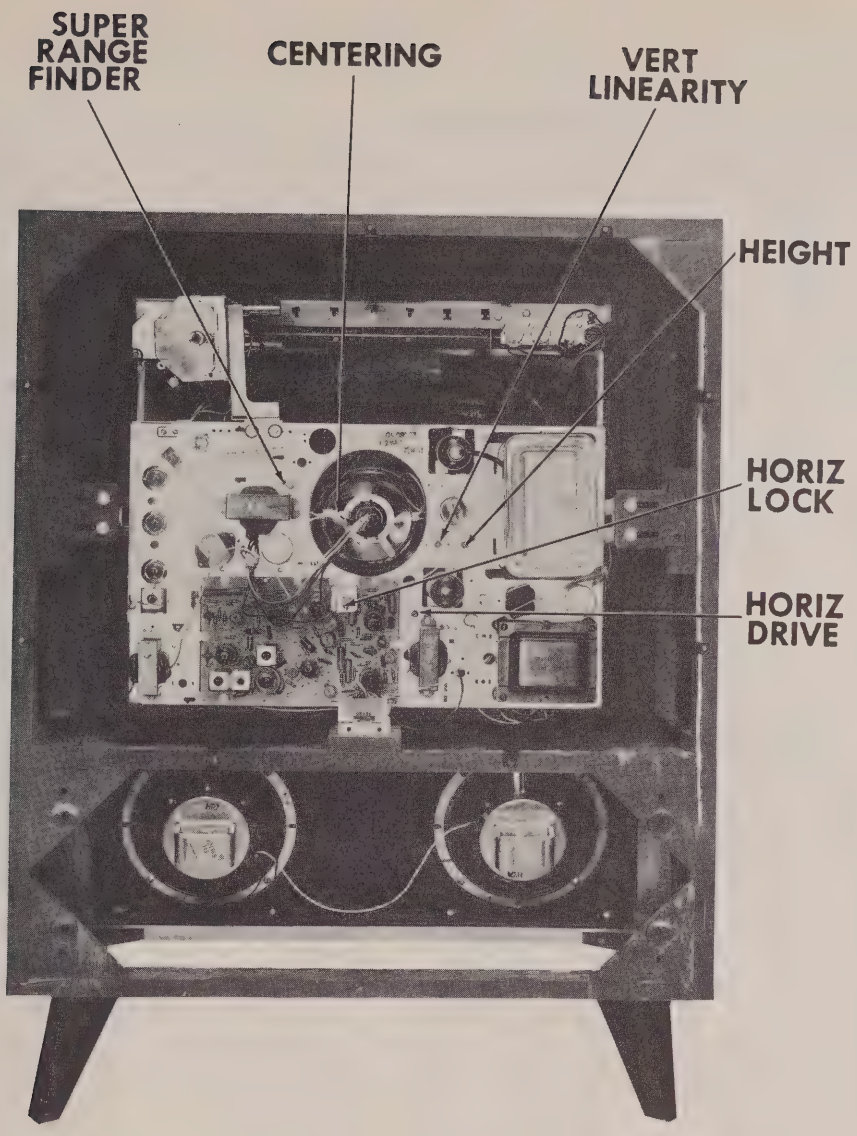


VIDEO IF—PRINTED BOARD

SET 397 FOLDER 1



CHASSIS-BOTTOM VIEW



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Turn the set on and tune in a TV station, preferably with a test pattern.
2. Set the brightness and contrast controls for a normal picture.
3. Turn the horizontal lock clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.
4. Turn the horizontal lock slowly counter clockwise until the picture just falls into sync.
5. Turn to an unused channel. If vertical lines appear near the center of the screen, slowly adjust the horizontal drive control (R7) until white lines disappear.
6. If in step 5 the horizontal drive was adjusted, tune in a TV station and repeat steps 3 and 4. Check horizontal sync by switching off channel and back again.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	1st Video IF Amp	6BJ6	
V2	2nd Video IF Amp	6BJ6	
V3	3rd Video IF Amp	6J86	
V4	Video Output-Sound IF Amp	6AW8A	
V5	Keyer Out	6U8A	
V6	Audio Output	6AQ5	
V7	Sync Sep.-Noise Limiter - AGC Keying	6BL8	
V8	Sync Phase Inv. - Vert. Mult.	6CG7	
V9	Vert. Mult.-Vert. Output	6DB5	
V10	Horiz. Mult.	6U8	
V11	Horiz. Output	6CG8GA	
V12	Damper	6AL4GTA	
V13	HV Rectifier	1B3GT	
V14	LV Rectifier	5V3	

PICTURE TUBE

ITEM No	REPLACEMENT DATA: ADMIRAL PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	NOTES
V15	21CEP4A		21CEP4-A ①	21CEP4	① "Silverama" ②

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP	VOLT	ADMIRAL PART No	AEROVOX PART No	CORNELL DUBILIER PART No	MALLORY PART No	PYRAMID PART No	SANGAMO PART No	SPRAGUE PART No
C1A	450	350	67D45-308	AFH3-450-45	CG324	FP350-9	TMT-464	CD-1TT MT-4520 Q-449	TVL-2639
B	450	300	67D45-308	AFH4-309					*R2631
C2A	45	300							
B	45	250							
C	30	50							
D	450	50							
C3	20	300	67D4-18	PRS450V20	BR1035	TC65	TD-20-350	MT-4520	TVA-1608
C4A	450	300	67D45-204	AFH3-41	CG320	FP398-2	TMT-47	D-124	*R2574
B	450	300							

* Non-catalog item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING: CAP	VOLT	ADMIRAL PART No	AEROVOX PART No	CENTRALAB PART No	CORNELL-DUBILIER PART No	ERIE PART No	MALLORY PART No	SPRAGUE PART No	NOTES
C5	14		65D6-40	-						NPO 2%
C6	.5-8		66A38-6							
C7	18		66A38-181							NPO 5%
C8	3-		66A38-7							
C9	10.5									
C9	1.0	100	64A10-3	P388N-1.0		CUB2W1		GEM-31	ETM-M1	
C10	820		65C10-81		DD-821	BYA10T82	ED-820		SGA-T82	
C11	820		65C10-81		DD-821	BYA10T82	ED-820		SGA-T82	
C12	820		65D10-81		DD-821	BYA10T82	ED-820		SGA-T82	
C13	820		65D10-81		DD-821	BYA10T82	ED-820		SGA-T82	
C14	820		65D10-81		DD-821	BYA10T82	ED-820		SGA-T82	
C15	820		65D10-81		DD-821	BYA10T82	ED-820		SGA-T82	
C16	820		65C10-81		DD-821	BYA10T82	ED-820		SGA-T82	
C17	680		65D6-131							
C18	5000		65D10-502	BPD-005	DD-502	BYA10D5	ED-005	DCS25	SHK-D5	M3300 5%
C19	820		65D10-81		DD-821	BYA10T82	ED-820		SGA-T82	
C20	3.3		65D6-89	NPO-DI 3.3	DT2-3R3	CD5Y33C	TCC-3.3	ZT-5533	ETCCB-V33	NPO 10%
C21	6.8		65D6-68	NPO-DI 6.8	TC2-6R8	CA6V68C	TCC-6.8	ZT-5568	ETCCB-V68	10%
C22	47		65D10-92		TCZ-47		TCC-47			NPO 5%
C23	.22	400	64B8-34	P488N-33		CUB4S22		GEM-4022	ATM-P22	
C24	.001	1600	64B3-32	P188N-001	DD18-102	CUB1S01	HD3-1000	GEM-1831	MB-D1	①
C25	10000		65D10-42	BPD-01	DD-103	BYA8S1	ED-01	DCS11	SHK-S1	
C26	.022	400	64B9-30	P488N-Q22	DD-203	CUB4S22	ED-02	GEM-4223	ATM-S22	
C27	4.7		65B28-047	NPO-SI 4.7	TCZ-4R7	C10Y47C	TCC-4.7	ZT-5547	ETCCB-V47	10%
C28	47		65C10-92	NPO-SI 47	TCZ-47	C10Q47C	TCC-47		ETCC-Q47	NPO
C29	47		65C10-92	NPO-SI 47	TCZ-47		TCC-47			NPO 5%
C30	4.5		65B27-045							5%
C31	1000		65D10-53	BPD-001	DD-102	BYA5D1	ED-1000	DC521	SHK-D1	
C32	82		65C10-98							NPO 5%
C33	18		65C10-160							M330 5%
C34	.047	200	64C9-47	P388N-047		BC384U		ACE6147	38E-S47	
C35	4700		65D10-71	BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	58K-D47	
C36	10000		65D10-42	BPD-01	DD-103	BYA8S1	ED-01	DCS11	SHK-S1	
C37	.047	800	64C8-9	P688N-047		BC384U		ACE6147	88E-S47	
C38	300		65D10-141	DI -0003	DD-301	L10T3	ED-300	UC-533	SGA-T3	
C39	10000		65D10-42	BPD-01	DD-103	BYA8S1	ED-01	DCS11	SHK-S1	
C40	4700		65D10-112	BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	58K-D47	②
C41	4700		65D10-112	BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	58K-D47	
C42	10000		65D10-42	BPD-01	DD-103	BYA8S1	ED-01	DCS11	SHK-S1	
C43	10000	1600	65D10-65	DAC-27	DD16-103	HVS1S01		GEM-1631	MB-S1	
C44	.1	200	64C16-53	P283N-1		BC2P1J		AC8401	38E-P10	
C45	150		65D10-80	BPD-00015	DD-151	L10T15	ED-150	UC-5315	SGA-T15	
C46	10000		65C10-42	BPD-01	DD-103	BYA8S1	ED-01	DCS11	SHK-S1	
C47	4700		65D10-71	BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	58K-D47	
C48	4700		65C10-71	BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	58K-D47	
C49	10000		65C10-42	BPD-01	DD-103	BYA8S1	ED-01	DCS11	SHK-S1	
C50	2200		65D10-111	BPD-0022	DD-222	BYA10D22	ED-0022	UC-5222	SGA-D22	
C51	.047	200	64C15-155			BC6P1J		AC2601	48E-P10	10%
C52	.1	400	64C16-30							2%
C53	.1	600	64C16-230							
C54	.001	2000	64B2-33		DD30-102	CUB6G1X	HD3-1000	GEM-3231	TVM-J16	
C55	.047	200	64B8-41	P388N-047	DF-503	CUB2S47		GEM-4147	ATM-S47	
C56	.022	600	64B33-11							10%
C57	.001	600	64B2-34					GEM-1631		10%
C58	.001	600	64B2-34					GEM-1631		
C59	4700		65D10-71	BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	58K-D47	
C60	.033	300	64C16-57	P288N-033		BC2S33J	ED-03		38E-S33	
C61	3900		65B21-393	1464-0039		1R5D39			MS-339	10%
C62	390		65B21-391		D6-391	5R5T39	ED-390		MS-339	10%
C63	330		65B21-331	1464-00068	D6-681	1R1T68	ED-680		MS-366	10%
C64	4700		65D10-71	BPD-0047	DD-472	BYA10D47	ED-4700	UC-5247	58K-D47	
C65	.047	400	64B8-33	P488N-047	DF-503	CUB4S47		GEM-4147	ATM-S47	
C66	.01	600	64B6-32	P688N-01	DD-103	CUB4S1	GP-10000	GEM-411	ATM-S1	
C67	.1	800	64B8-7	P688N-1	DF-104	CUB6P1		GEM-651	ETM-P1	
C68	.033	600	64C33-10	P688N-033	DF-303	CUB6S33		GEM-6133	ETM-S33	
C69	150	3000	65D10-149							M500 10%
C70	150	3000	65D10-149							M500 10%
C71	150	3000	65D10-149							M500 10%
C72	.047	600	64B4-36	P688N-047	DF-503	CUB6S47		GEM-6147	ETM-S47	

① Chassis 17AC1, 17AG1, 17C1, 17G1 stamped run 10 use 3000mmfd & 1000V in this application.
② Chassis stamped run 24 and higher use 1000mmfd in this application

CONTROLS

ITEM No	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: ADMIRAL PART No	CENTRALAB PART No	CLAROSTAT PART No	IRC PART No	MALLORY PART No	INSTALLATION NOTES
R1A	1meg	½	75B36-2	ABT-7417 †	A47P3-1meg		FP16TS	Volume-Tap at 100K
B	Shaft			AK-8	RS-3/16		Not Req.	
C	Switch			KB-1 or KR-1 *	SWF 12		Not Req.	
R2A	2meg	½	75D3-96	AB-76 †	A47-2meg-S	QI-139	U58	Tone
B	Shaft			AK-8	RS-3/16	NQ	D6-37	
R3A	100K	½	75B17-22	F1-31			#(E)3790	Brightness Contrast
B	100Ω	½		R2-5				Vert. Hold
R4A	400K	½	75D3-92	AB-46 †	A47-400K-S	QI-139	U43	
B	Shaft			AK-8	RS-3/16	NQ	D6-37	Vert. Lin.
R5A	500Ω	½	75D80-103	AB-6	A47-500-S	QI-103	PTA2AL	
B	Shaft			AK-1	FK3-1/4	TQ	Not Req.	Height
R6A	1.5meg	½	75D80-105	BX-743	A47-1.5meg-S	QI-136	TA15SL	
B	Shaft			Not Req.	FK3-1/4	TQ	Not Req.	Horiz. Drive
R7A	10K	½	75D20-106	AB-14	A47-10K-S	QI-116	TA1SL	
B	Shaft			AK-1	FK3-1/4	TQ	Not Req.	
R8A	10K	½	75D80-101	AB-40	A47-100K-S	QI-138	PTA1SL	Super Range Finder
B	Shaft			AK-19	RN-3	TQ	Not Req.	

† Use AK-18 shaft coupler.
* Use KR with CRL "red label" controls and KB with "blue label" controls.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING: OHMS	WATT	ADMIRAL PART No	NOTES
R9	4700Ω		80B8-472	
R10	10000		80B8-102	
R11	39K		80B8-393	Note 1
R12	47Ω		80B8-470	
R13	470Ω		80B8-471	
R14	22K		80B8-223	
R15	220K		80B8-224	
R16	4700Ω		80B8-472	Note 2
R17	68Ω		80B8-680	
R18	220K		80B8-224	
R19	470Ω		80B8-471	
R20	470Ω		80B8-471	
R21	150Ω		80B8-151	Note 3
R22	3900Ω		80B8-392	
R23	100Ω		80B8-101	
R24	3900Ω		80B8-392	
R25	180Ω		80B8-181	Note 4
R26	5600Ω	4	61B24-443	
R27	68K		80B8-683	
R28	220K		80B8-224	Note 5
R29	4.7meg		80B8-475	
R30	820Ω	1	60B14-821	
R31	47K		80B8-473	
R32	15K		80B8-153	
R33	2.2meg		80B8-225	
R34	150K		80B8-154	
R35	10meg		80B8-106	Note 6
R36	100K		80B8-104	
R37	47K	1	60B14-473	
R38	100K		80B8-104	Note 7
R39	560K		80B8-564	
R40	820Ω		80B8-821	
R41	680Ω		80B8-681	
R42	430K 5%		60P7-434	
R43	22K		80B8-223	Note 8
R44	470K		80B8-474	
R45	220Ω	2	60B20-221	
R46	270Ω	2	60B20-271	
R47	47K		80B8-473	
R48	390K		80B8-394	
R49	4.7meg		80B8-475	
R50	15K		80B8-153	
R51	270K		80B8-274	
R52	47K		80B8-473	
R53	56K		80B8-563	
R54	4.7meg		80B8-475	
R55	2.4meg		80B8-245	
R56	3300Ω		80B8-332	
R57	6800Ω		80B8-682	
R58	5600Ω		80B8-562	
R59	15K		80B8-153	
R60	15K		80B8-153	
R61	220K		80B8-224	
R62	56K		80B8-563	
R63	470K		80B8-474	
R64	2.2meg		80B8-225	
R65	100Ω		80B8-101	
R66	180Ω	1	60B14-181	
R67	18K	1	60B14-183	
R68	220K		80B8-224	
R69	470Ω	3	61B24-317	
R70	39K		80B8-393	
R71	470Ω			
R72	220Ω			
R73	3.5Ω Cold		61A47	Note 9
R74	100K 5%		60B7-104	
R75	100K 5%		60B7-104	
R76	4.7meg		80B8-475	
R77	470K		80B8-474	
R78	560Ω		80B8-562	
R79	120K 5%			Note 10
R80	1meg			Note 10
R81	100Ω		80B8-102	
R82	82K		80B8-823	
R83	470K		80B8-474	
R84	100Ω		80B8-101	
R85	100Ω		80B8-101	
R86	10K	3	61B24-349	
R87	22K	2	60B20-223	
R88	220K		80B8-224	
R89	470Ω		80B8-472	
R90	1.2Ω			Note 11
R91	2200Ω		60B8-222	Note 12
R92	2000Ω	2	60B20-222	Note 13
R93	3000Ω	7	61B20-45	
R94	1000Ω	2	60B20-102	
R95	270K	1	60B14-274	Note 14
R96	270K		80B8-274	

Note 1. Chassis 17AC1 and 17AG1 use 18K in this application.
Note 2. Chassis 17AC1 and 17AG1 use 5600Ω in this application.
Note 3. Chassis 17AC1 and 17AG1 use 220Ω in this application.
Note 4. Some versions may use 470Ω in this application.
Note 5. Chassis 17C1B and 17G1B use 120K in this application.
Note 6. Chassis 17AC1 and 17AG1 (Stamped Run 16, 19, 20) use 15meg in this application.
Note 7. Chassis stamped Run 16 and higher use 220K in this application.
Note 8. Chassis 17C1, 17AC1, 17G1, 17AG1 (Run 24) use 47K in this application.
Note 9. Temperature compensating resistor
Note 10. Some versions may use a single 100K 5% (Part #60B7-114) in this application.
Note 11. Some versions may use 1.5Ω (Part #60B28-46) in this application.
Note 12. Chassis stamped Run 10, Run 11 use 4700Ω in this application. Chassis stamped Run 20 and higher use an alternate circuit. as shown on the schematic.
Note 13. Chassis 17AC1, 17AG1 use 1800Ω 2W , and Chassis 17C1B and 17G1B use 8200Ω 2W in this application.
Note 14. Not used in chassis stamped Run 10 thru Run 14.

TRANSFORMER (POWER)

ITEM No	RATING: PRI	SEC. 1	SEC. 2	SEC. 3	SEC. 4	SEC. 5	REPLACEMENT DATA: ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC ±1.8A	520VCT ± 300A	5VAC @3.5A				80C35-12		P-8830 ①			26R88 ①	R-58C ①
				6.3VAC @10A									

① Phase and parallel 6.3V filament windings for required current.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA: ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	Vert. Output	79B43-14						A-113X	
T3A	Yoke-Horiz.(18 6MH)	94D47-3		MDF-117				Y-60 &	
B	(30°)-Vert.(13 6MH)	1-2						NW25	
	Alt Yoke	94D50-3							
		1-4							
M6	Rear Cover & Centering Device	94C14-8-1 ③							
	Rear Cover & Centering Device	94D14-8-1 ④							
T4	Horiz. Output	79D77-3							

① Includes resistors (R71, R72 and R73).
② 3 3/4" diameter yoke.
③ Used with 3 3/4" diameter yoke.
④ 5 1/4" diameter yoke.
⑤ Used with 3 1/4" diameter yoke.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	10000Ω	3-4Ω	79B78-4		A-3021	AU-606		26S47	S-15X ①	① Drill one new mounting hole.

SPEAKER

ITEM No	TYPE: SIZE	FIELD	V C IMP	REPLACEMENT DATA: ADMIRAL PART No	QUAM PART No	NOTES
SP1	8"	PM	6-8Ω	76D35-3 ①	8AU26.7	① Used in Models C21F43, 43, CA21F43, 43
SP2	8"	PM	6-8Ω	76D35-5 ②	8AU26.7	② Used in Models T21F33,33, TA21F33, 33
	4"	PM		78B136-4 ③		
	6"	PM		78C134-4 ③		

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: ADMIRAL PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	47.25MC Trap Coil	73B37-3		19-1001	BC-562	4604	1.48 Microhenries
L2	41.25MC Trap Coil	73B37-3		19-1001	BC-562	4604	1.48 Microhenries
L3	1st. Video IF	72C13J-31					
L4	2nd. Video IF	72C13J-33					
L5	Fil. Choke	73B37-3		19-1001	BC-562	4604	1.4 Microhenries
L6	3rd. Video IF	72C13J-38					
L7	4th. Video IF	72B31H-6					Includes C20 & M3
L8	Resonant Choke	73B24-7					7.7 Microhenries
L9	Shunt Peaking Coil	73B25-20		19-3500	TV-303	6174	500 Microhenries
L10	Resonant Choke	73B31-5					28 Microhenries
L11A	4.5MC Trap	72B18S-3					Includes C23, C37 & C28
B	Int. Sound IF						
L12	Series Peaking Coil	73B25-23		19-3160 *	TV-184	6180 *	V2-5 * 185 Microhenries, wound on 47000Ω resistor
L13	Shunt Peaking Coil	73B5-26					Wound on 10K resistor
L14	2nd. Sound IF	72B18S-1					
L15	Quadrature Coil	72C32-37					

* Parallel with a 47000Ω resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.: PRI.	SEC.	REPLACEMENT DATA: ADMIRAL PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	NOTES
L16	52Ω		94C17-4		TV-184				22-46 Millihenries

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE IO CURRENT 1000 (%)	REPLACEMENT DATA: ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
L17	.285A	43Ω	1.5 Hy.	74B18-25	C5037	C-2996		C-3326 ①	26C93	C-17X

① Drill new mounting hole.

RECTIFIERS

ITEM No	RATING: CURRENT (Measured)	REPLACEMENT DATA: ADMIRAL PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1		92B6-4 ①	1215 ①②		171 ①②		① Selenium type. ② Two required.

FUSES

ITEM No	TYPE	RATING	REPLACEMENT DATA: ADMIRAL PART No. FUSE	ADMIRAL PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2	N	1/2A-125V-S/B	84A13-36		332 500 (N 1/2A-125V-S/B)	346008	N 1/2	HN 3/0 to 1/2

PARTS LIST AND DESCRIPTIONS (Continued)

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		ADMIRAL PART No.	CBS PART No.	SYLVANIA PART No.	
M3	1N87 *	1N87	1N60	1N60	Video Detector (Pigtail)

* A 1N295 or 1N60 may be used in some versions.

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M4	Lamp	81A1-5	#44
M5	Tuner	94E144-25	VHF Chassis 17C1, 17G1
	Tuner	94E144-15	VHF Chassis 17C1, 17G1
	Tuner	94D151-7	VHF Chassis 17C1B, 17G1B
	Tuner	94D151-8	VHF Chassis 17C1B, 17G1B
	Tuner	94E144-11	UHF-VHF Chassis 17AC1, 17AG1
	Tuner	94E144-23	UHF-VHF Chassis 17AC1, 17AG1
	Tuner	94D112-3	UHF Chassis 17AC1, 17AG1
M6	Centering Device	94C148-1	Includes yoke rear cover

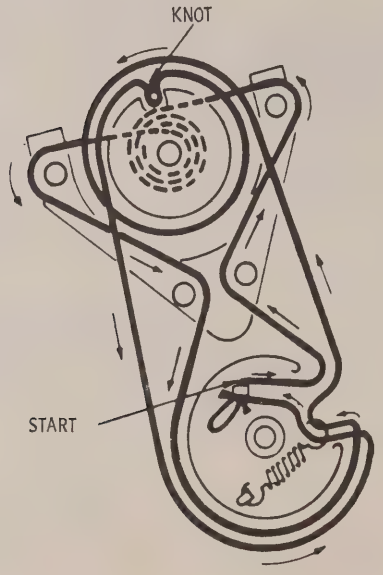
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

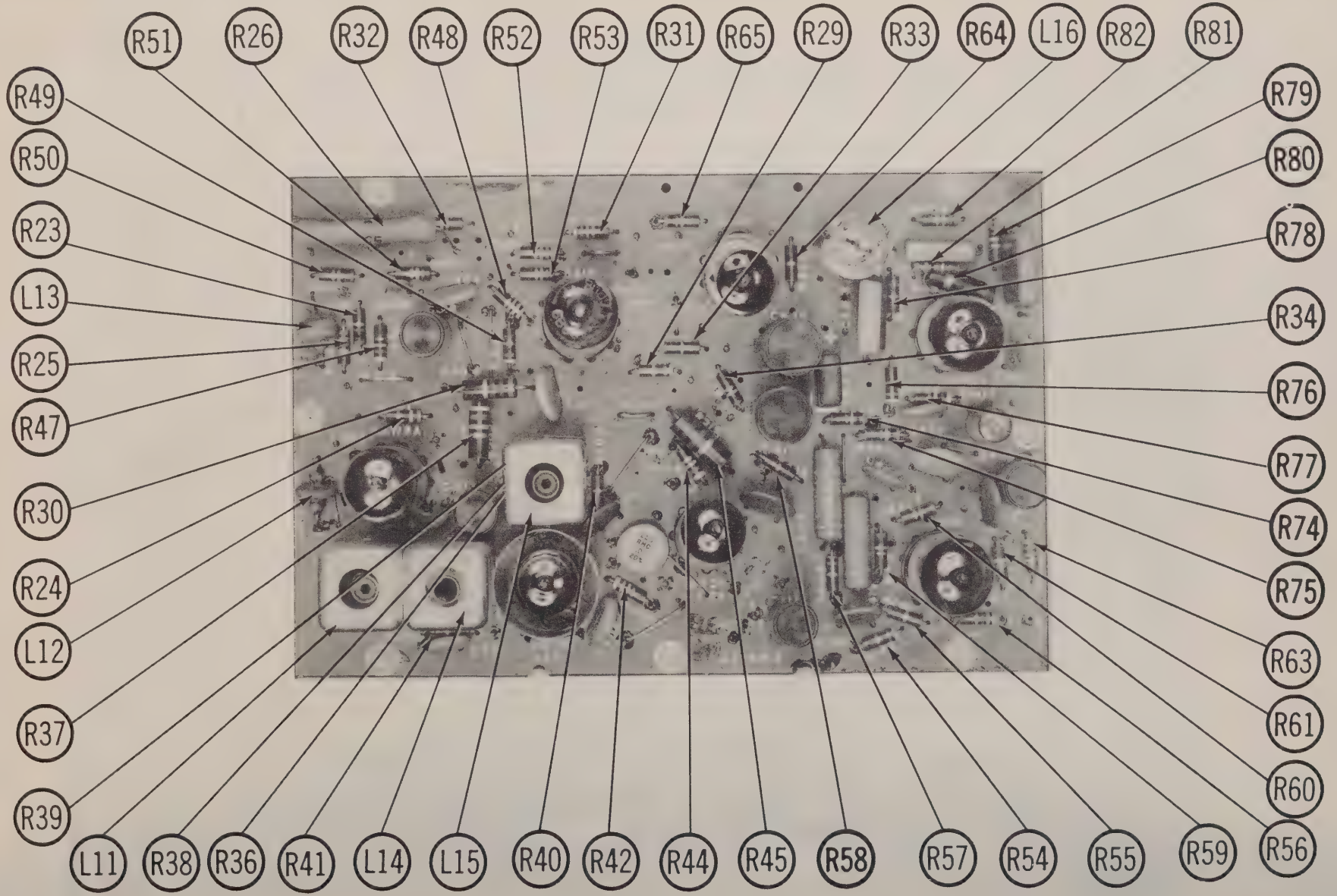
NAME	PART NO.	DESCRIPTION
Safety Glass	21D96-2	Models T21F32, 33, TA21F32, 33
Safety Glass	21D97-2	Models C21F42, 43, CA21F42, 43
Mask	23E285-2	Models T21F32, 33, TA21F32, 33
Mask	23E286-6	Models C21F42, 43, CA21F42, 43
Knob	33D231-4	VHF Channel Selector - Models T21F32, 33
Knob	33D231-10	VHF Channel Selector - Models C21F42, 43, CA21F42, 43
Knob	33D231-2	VHF Channel Selector - Models TA21F32, 33
Knob	33D231-8	Fine Tuning - Models T21F32, 33, TA21F32, 33
Knob	33D231-16	Fine Tuning - Models C21F42, 43, CA21F42, 43
UHF Dial	33D199-46	Models TA21F32, 33
UHF Dial	33C257-3	Models CA21F42, 43
Knob	33C230-5	Brightness
Knob	33C230-2	On-Off-Volume, Contrast
Knob	33C230-3	Tone, Vertical
Cabinet	34E123-2	Models T21F32, TA21F32
Cabinet	34E123-3	Models T21F33, TA21F33
Cabinet	35E399-2	Models C21F42, CA21F42
Cabinet	35E399-3	Models CA21F43, CA21F43

WIRING DATA

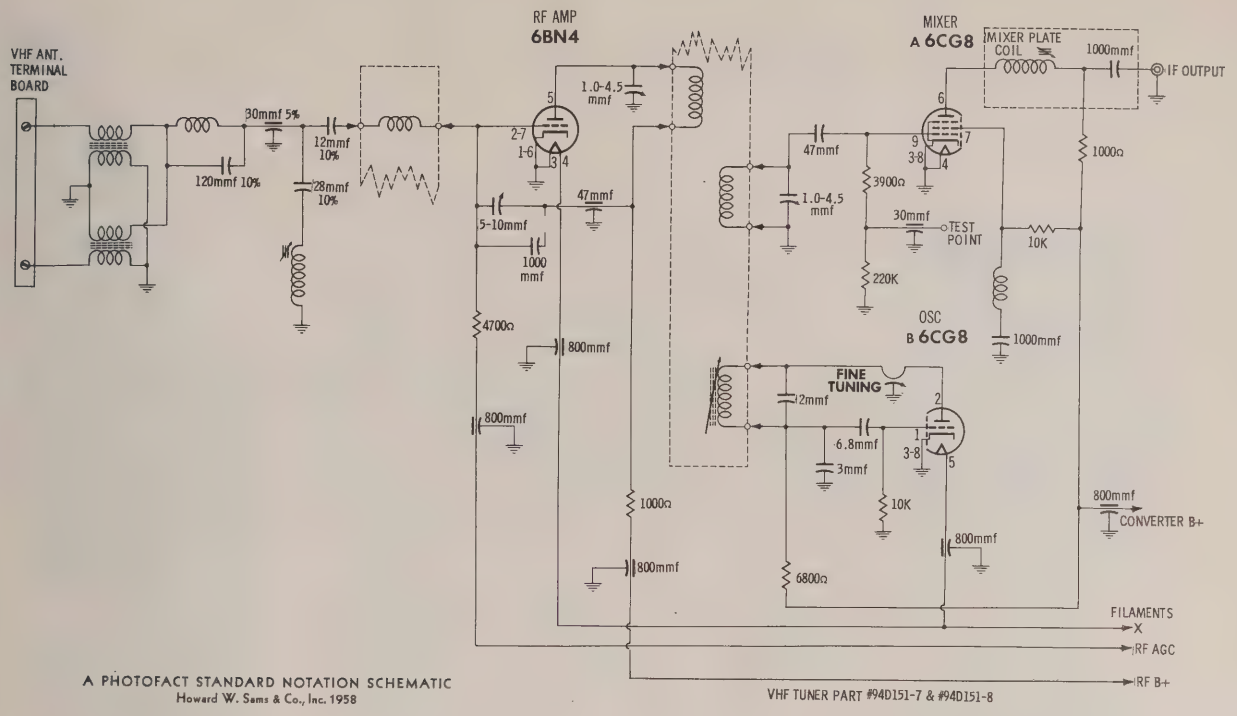
High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor



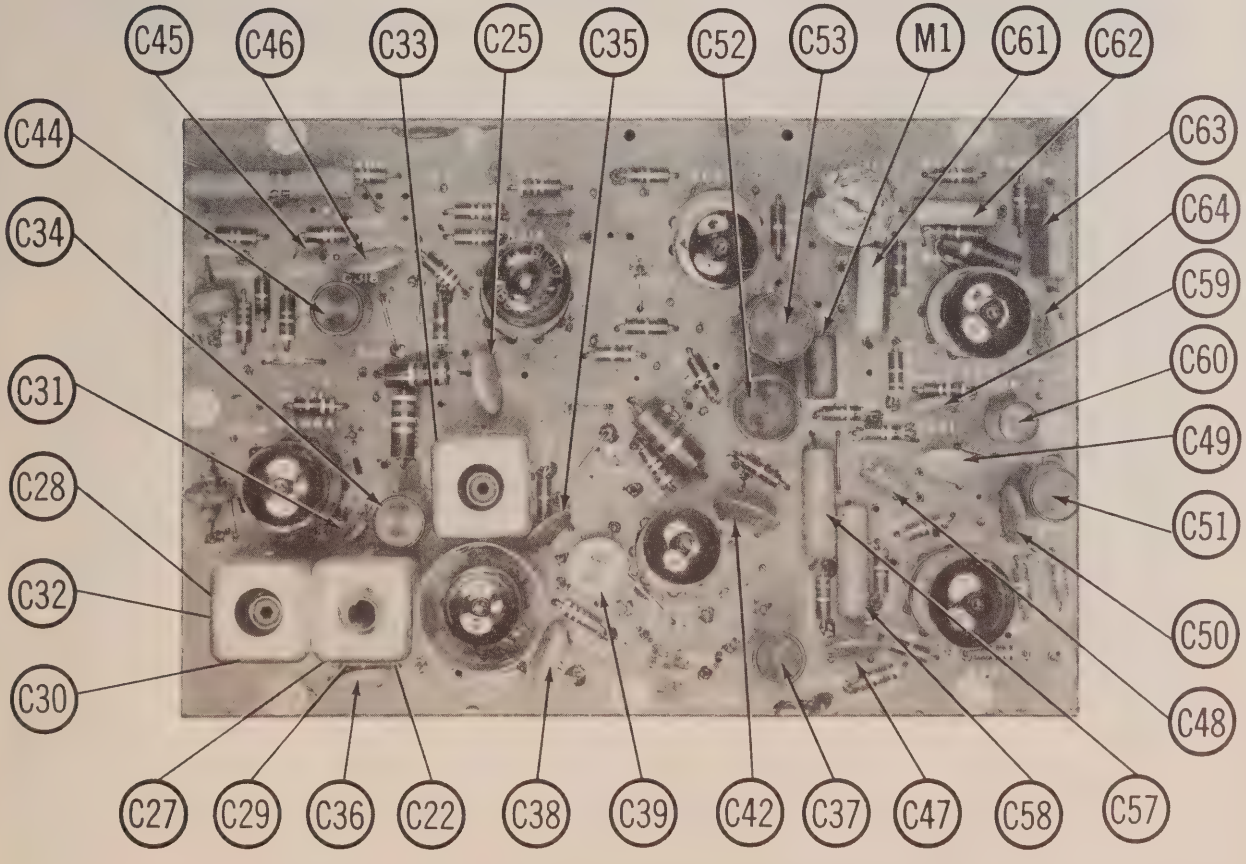
DRIVE CORD



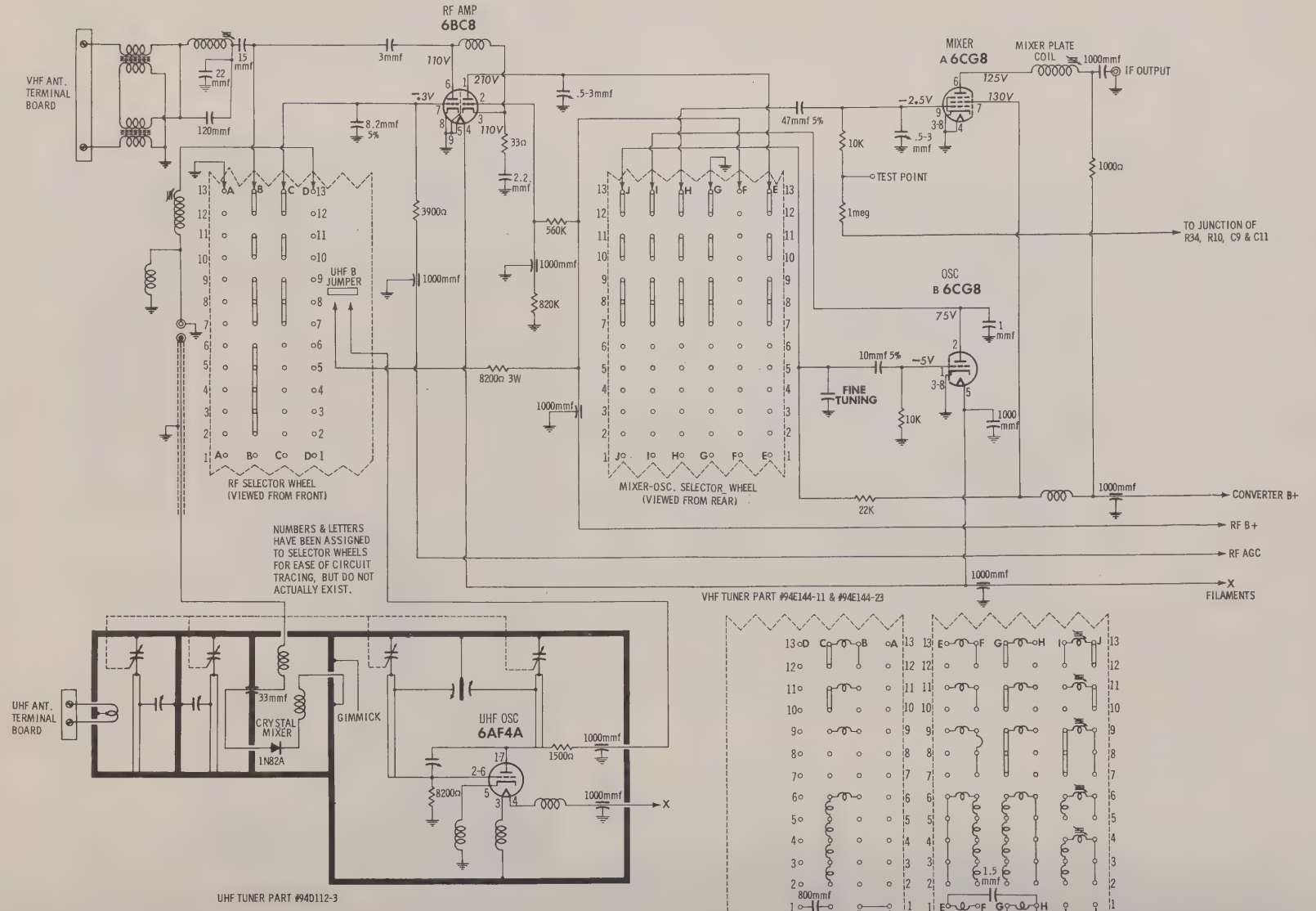
RESISTOR IDENTIFICATION



ALTERNATE VHF TUNER SCHEMATIC



CAPACITOR IDENTIFICATION



A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

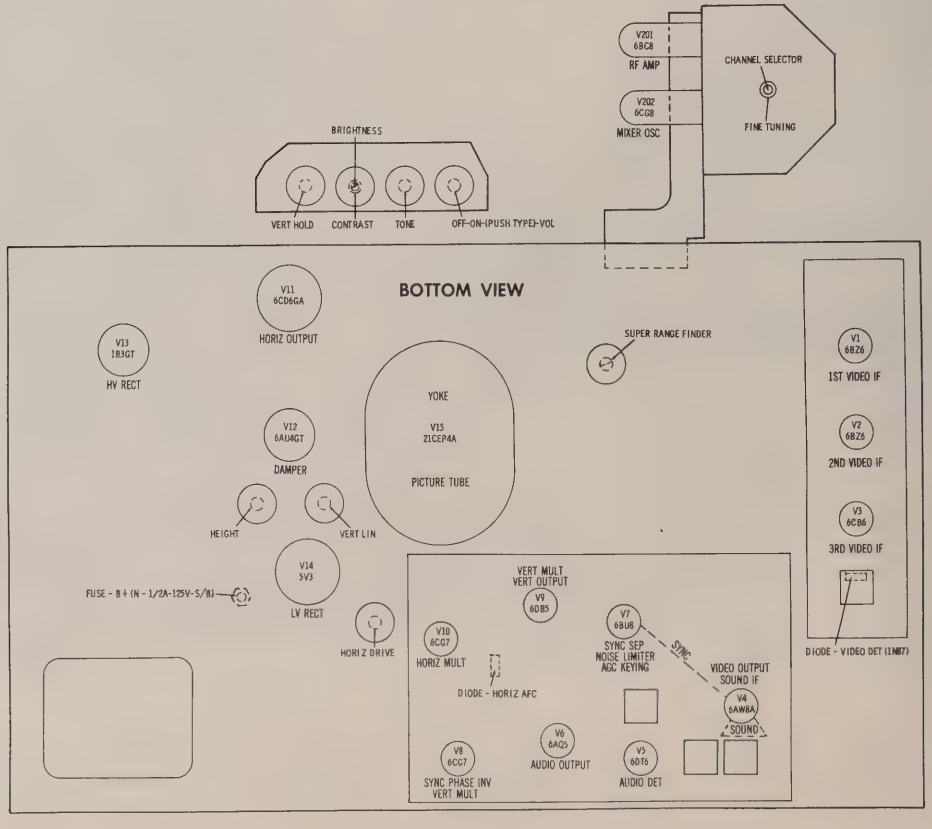
ALTERNATE UHF-VHF TUNER SCHEMATIC

CHASSIS TOP VIEW

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	150K	47Ω	0Ω	.1Ω	▲ 470Ω	▲ 470Ω	0Ω		
V2	6BZ6	▲ 22K	▲ 68Ω	.1Ω	0Ω	† 470Ω	† 470Ω	130K		
V3	6CB6	.1Ω	150Ω	.1Ω	0Ω	† 4500Ω	† 4500Ω	0Ω		
V4	6AW8A	0Ω	100K	† 47K	0Ω	.1Ω	• 25Ω	4000Ω	† 7900Ω	† 5600Ω
V5	6DT6	15Ω	680Ω	0Ω	.1Ω	‡650K	† 12K	560K		
V6	6AQ5	470K	270Ω	.1Ω	0Ω	† 500Ω	† 220Ω	470K		
V7	6BU8	† 4000Ω	† 8200Ω	1.7meg	.1Ω	0Ω	† 14K	† 390K	† 23K	† 4.7meg
V8	6CG7	• † 1.3meg	220K	• 100K	.1Ω	0Ω	† 12K	1.4meg	3300Ω	0Ω
V9	6DB5	† 18K	• 220Ω	2.2meg	.1Ω	0Ω	2.2meg	• 220Ω	NC	† 750Ω
V10	6CG7	† 5600Ω	530K	1000Ω	.1Ω	0Ω	† 82K	100K	1000Ω	0Ω
V11	6CD6GA	TP	0Ω	0Ω	NC	470K	TP	.1Ω	† 10K	TOP CAP ‡9Ω
V12	6AU4GTA	NC	NC	INF	NC	† 42Ω	NC	.1Ω	0Ω	
V13	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡459Ω
V14	5V3	NC	¶	NC	17Ω	NC	16Ω	NC	¶	
V15	21CEP4A	0Ω	39K	‡320K	† 0Ω	NC	NC	• 200K	.1Ω	
V201	6BC8	† 2200Ω	350K	INF	.1Ω	0Ω	INF	7meg	0Ω	0Ω
V202	6CG8	10K	† 12K	0Ω	0Ω	.1Ω	† 7200Ω	† 6200Ω	0Ω	1meg

¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
▲ MEASURED FROM PIN 7 OF V2.
† MEASURED FROM PIN 8 OF V14.
‡ MEASURED FROM PIN 3 OF V12.
NC NO CONNECTION.
TP TIE POINT.



TUBE PLACEMENT CHART

SET 397 FOLDER 2

OLYMPIC MODELS CD108, U, CD109, U, CD110P, PU, CH402, U, KD118, U, KD119, U, KD120, U, KH406, U, KH407, U, TD102, U (Ch. GD, GDU, GH, GHU)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 8 push-on type knobs from the front.

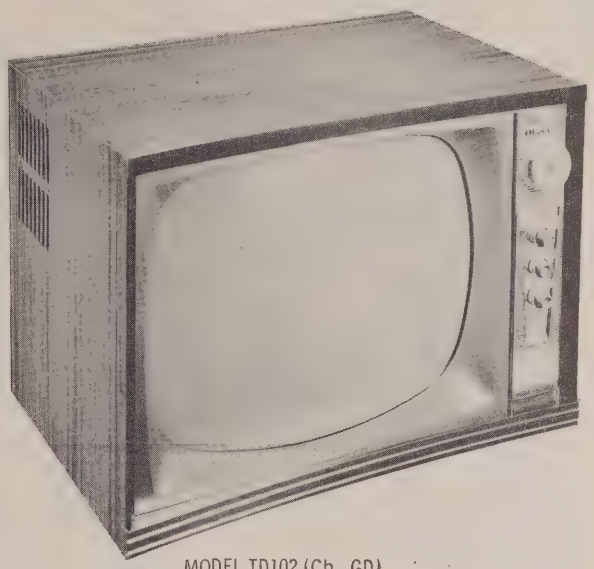
2. Remove 2 wood screws from the rear cover. Remove the rear cover.

3. Remove the picture tube socket, yoke plug, HV lead and speaker leads.

4. Remove 1 chassis bolt from the upper rear corner of the chassis.

5. Remove 3 chassis bolts from the bottom.

6. Remove the chassis.



MODEL TD102 (Ch. GD)

TRADE NAME	Olympic	MODELS	CHASSIS
		CD108, CD109, CD110P, KD118, KD119, KD120, TD102	GD
		CD108U, CD109U, CD110PU, KD118U, KD119U, KD120U, TD102U	GDU
		CH402, KH406, KH407	GH
		CH402U, KH406U, KH407U	GHU
MANUFACTURER	Olympic Radio & Television Inc., 34-01 38th. Ave., Long Island City 1, N.Y.		
TYPE SET	Television Receiver		
TUBES	Seventeen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 160 Watts, 1.4 Amp. @ 117 Volts AC		
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. The high band channels may be adjusted by the channel 13 adjustment located at 1 o'clock. (For individual high band adjustments it is necessary to compress or expand the coil accessible through the hole to the left of the shaft. Channel 6, 4 and 2 are adjusted by means of a slug accessible as the channels are selected. To adjust channels 5 and 3 switch to the next higher channel and adjust slug SLIGHTLY then recheck on desired channel. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 4 wood screws from the trim at the top of the safety glass. Tilt glass out at the top and lift up to remove.

FOCUS

The focus may be varied by the position of a strap on the base of the picture tube. The strap can be connected between pins 6 and 1 or 6 and 10.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Set the horizontal hold at the center of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally. (For location, see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENTS

To eliminate audio detector buzz, adjust the buzz control for MINIMUM buzz and maximum sound. (For location, see tube placement chart.)

FUSES

One fuse is used for horizontal sweep circuit protection. (For location, see tube placement chart.)

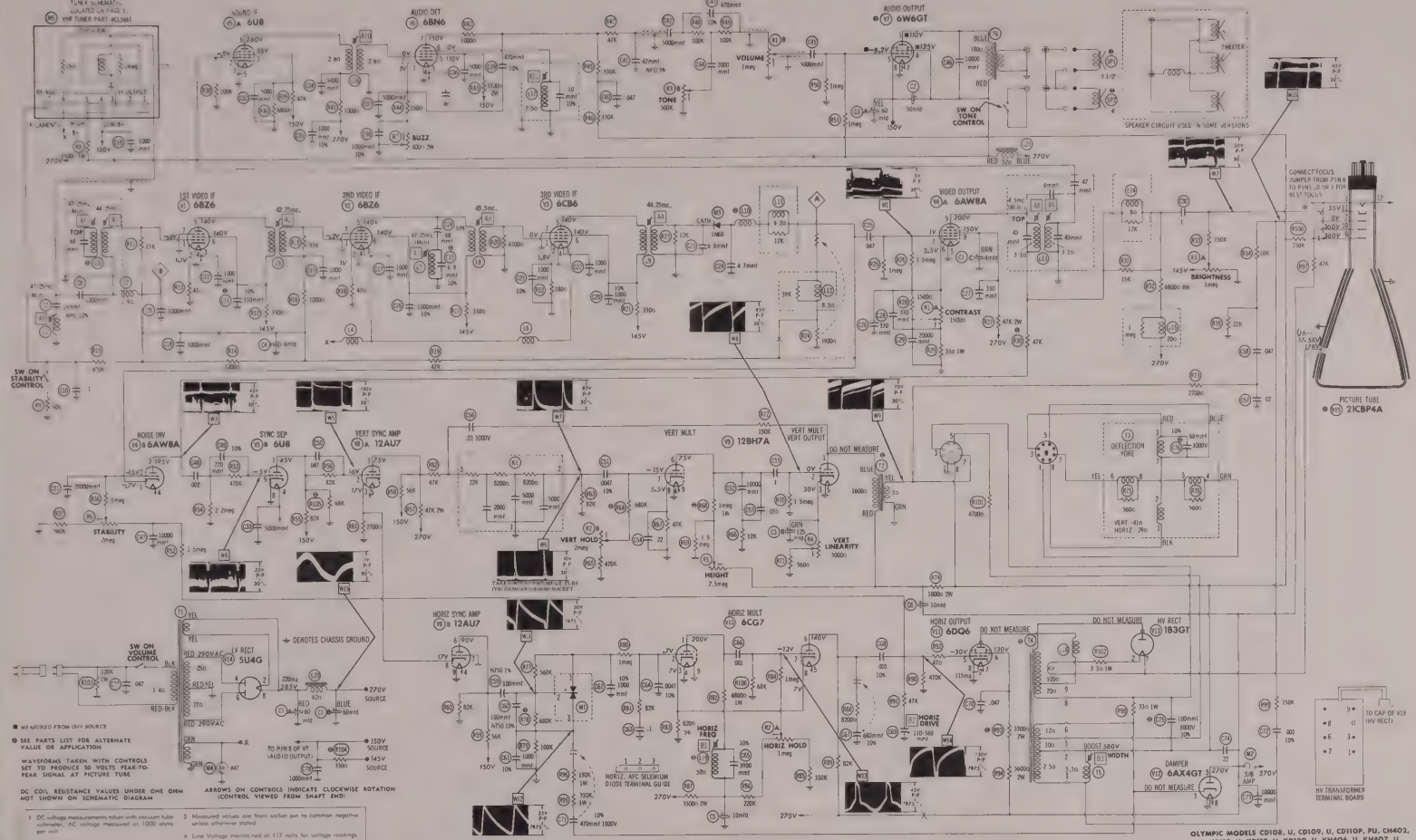
CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

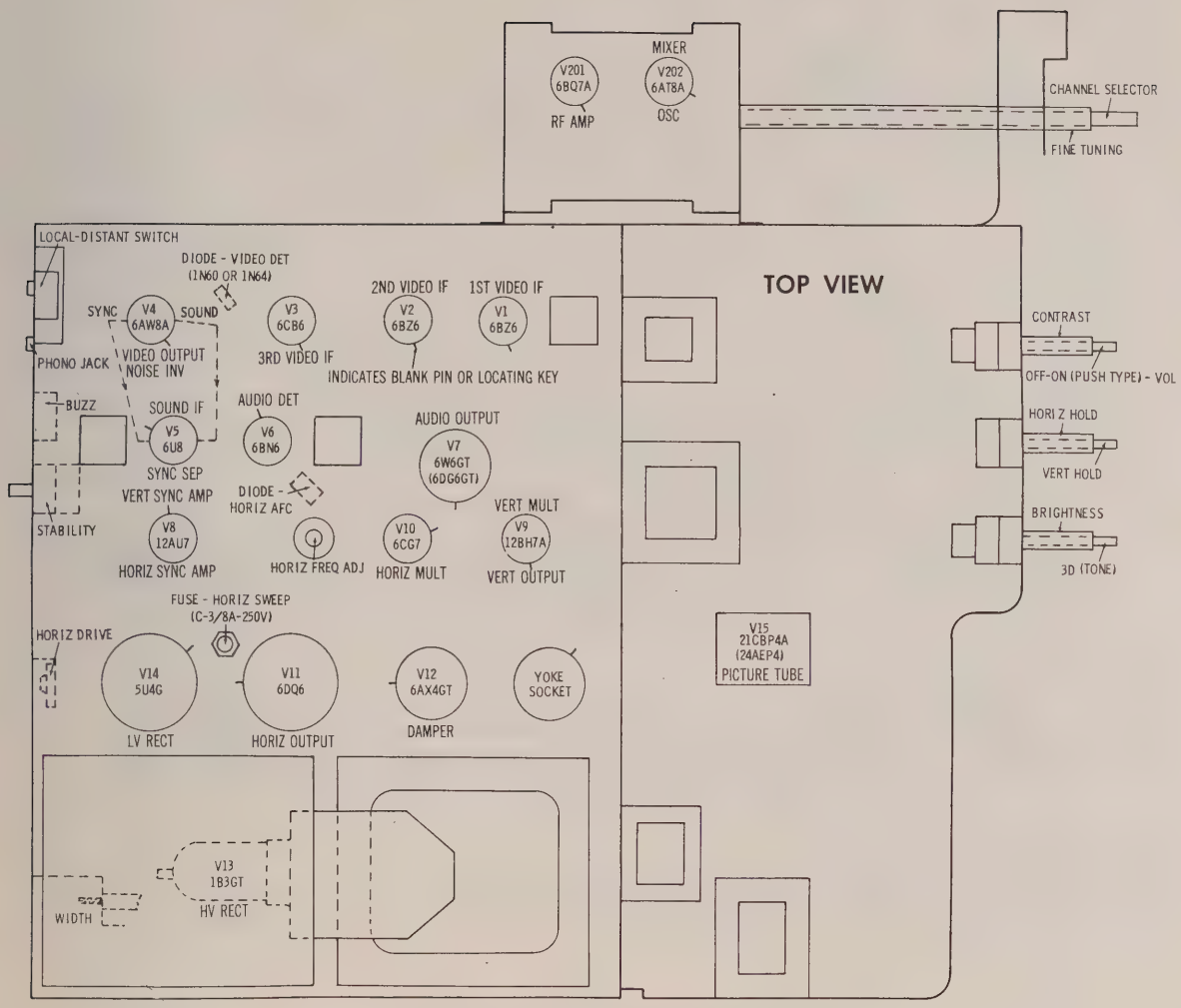
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America

H464


TUNER SCHEMATIC
VHF TUNER PART #CL3661
SOUND IF
V1A 6U8
AUDIO DET
V1B 6BN6
VOLUME
TONE
BUZZ
AUDIO OUTPUT
V7 6W6GT
SW ON TONE CONTROL
TWEETER
SPEAKER CIRCUIT USED IN SOME VERSIONS
1ST VIDEO IF
V1 6BZ6
2ND VIDEO IF
V2 6BZ6
3RD VIDEO IF
V3 6CB6
VIDEO OUTPUT
V4A 6AW8A
CONTRAST
BRIGHTNESS
CONNECT FOCUS JUMPER FROM PIN 8 TO PINS 10 OR 11 FOR BEST FOCUS
PICTURE TUBE
V15 21CBP4A
DEFLECTION YOKE
SW ON STABILITY CONTROL
NOISE INV
V5B 6AW8A
SYNC SEP
V5A 6U8
VERT SYNC AMP
V6A 12AU7
VERT MULT
V9 12BH7A
VERT MULT VERT OUTPUT
DO NOT MEASURE
VERT HOLD
VERT LINEARITY
HEIGHT
STABILITY
HORIZ SYNC AMP
V6B 12AU7
HORIZ MULT
V10 6CG7
HORIZ OUTPUT
V11 6DQ6
HV RECT
V12 1B3GT
HORIZ DRIVE
HORIZ FREQ
HORIZ HOLD
WIDTH
BOOST 580V
DAMPER
V12 6AX4GT
HV TRANSFORMER TERMINAL BOARD
SW ON VOLUME CONTROL
LV RECT
V14 5U4G
DENOTES CHASSIS GROUND
TO PIN 8 OF V7 (AUDIO OUTPUT)
270V SOURCE
150V SOURCE
145V SOURCE
HORIZ. AFC SELENIUM DIODE TERMINAL GUIDE
10 CAP OF V13 (HV RECT)
MEASURED FROM 150V SOURCE
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
1 DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1000 ohms per volt
2 Pin numbers are counted in clockwise direction on bottom of socket
3 Measured values are from socket pin to common negative unless otherwise stated
4 Line Voltage mainta ned at 117 volts for voltage readings
5 All controls set for normal operation, no signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958
OLYMPIC MODELS CD108, U, CD109, U, CD110P, PU, CH402, U, KD118, U, KD119, U, KD120, U, KH406, U, KH407, U, TD102, U (Ch. GD, GDU, GH, GHU)

OLYMPIC MODELS CD108, U, CD109, U, CD110P, PU, CH402, U, KD118, U, KD119, U, KD120, U, KH406, U, KH407, U, TD102, U (Ch. GD, GDU, GH, GHU)

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V14, V7**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V1, V2, V3, Diode (M3), V4, V7**
No pic, no sound, has snow - **V201, V202, V1, V7**
No pic, has sound, has raster - **V4, V15, V7**
Has pic, no sound - **V5, V6, V7**

SYNC FAILURE
No vert. sync - **V4, V5, V8, V7**
No horiz. sync - **V4, V5, V8, V7, Rectifier (M1)**
No vert. or horiz. sync - **V4, V5, V8, V7**

SWEEP FAILURE
No raster, has sound - **Fuse (M2), V10, V11, V12, V13**
No vertical deflection - **V9**
Poor vert. linearity or foldover - **V9**
Poor horiz. linearity or foldover - **V10, V11, V12**
Narrow picture - **V10, V11, V12, V14**
Vert. off freq. - **V9**
Horiz. off freq. - **V10**

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VIDEO IF ALIGNMENT

Use lowest negative scale on VTVM.
Preset A1 fully clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over mixer-osc. tube (V202). Low side to chassis.	44.5MC (Unmod)	Any non-interfering channel	DC probe thru 100K to point (A). Common to chassis. (Across video det. load).	Mixer Plate Coil	Use only enough generator output to provide a usable indication on VTVM. Adjust for maximum deflection.
2.	"	"	44.25MC	"	"	A1	"
3.	"	"	42.75MC	"	"	A2	"
4.	"	"	45.5MC	"	"	A3	"
5.	"	"	44.25MC	"	"	A4	"
6.	"	"	47.25MC	"	"	A5, A6, A7	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the negative lead of a 4 volt bias supply to point (B). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Direct	High side to ungrounded tube shield floating over mixer-osc. tube (V202). Low side to chassis.	44.5MC (10MC Swp)	41.25MC 42.5MC 45.75MC 47.25MC	Any non-interfering channel	Vert. Amp. thru 100K to point (A). Low side to chassis. (Across video det. load).		Check for response curve similar to Fig. 1. If necessary, SLIGHTLY retouch A1 thru A7 and mixer plate coil to obtain desired response.

4.5MC TRAP ALIGNMENT

Set the contrast control fully clockwise.
Remove the 6CB6 (V3) from its socket.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.01mfd	High side to point (A). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	RF probe to pin 11 (cathode) of picture tube. Low side to chassis.	A8	Use maximum generator output. Adjust A8 for MINIMUM deflection. Replace V3 in its socket.

SOUND IF ALIGNMENT

Tune in a TV station and adjust controls for normal operation.
Connect an output meter across the speaker voice coil. Adjust A9 and A10 for maximum deflection. Set the buzz control (R7) to the center of its range.
Adjust A11 for maximum deflection. Adjust the buzz control for MINIMUM buzz in the sound. Retouch A11 for maximum volume.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 15.

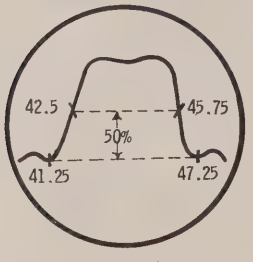
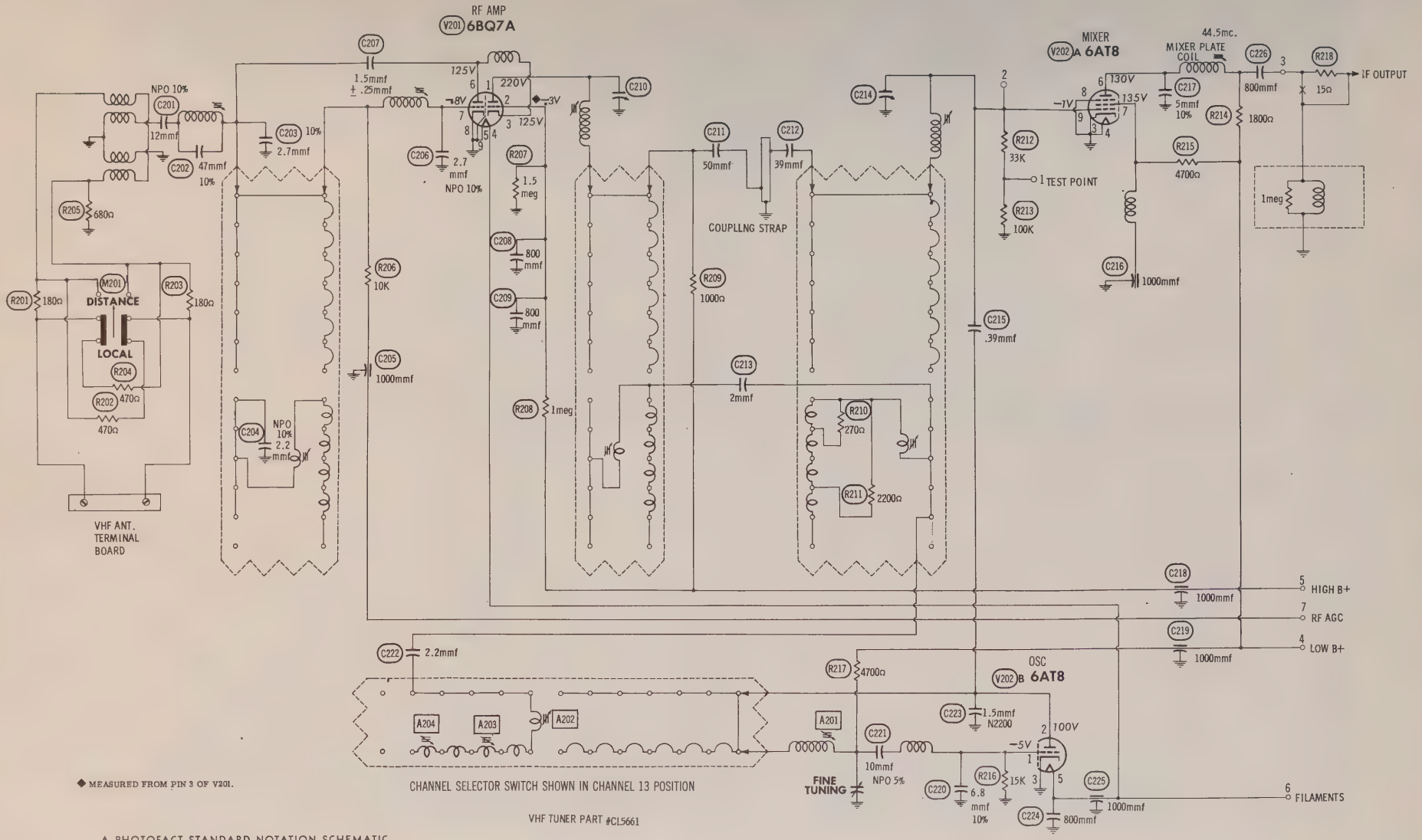


FIG. 1



A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

TUNER SCHEMATIC

OLYMPIC MODELS CD108, U, CD109, U, CD110P, PU, CH402, U, KD118, U, KD119, U, KD120, U, KH406, U, KH407, U, TD102, U (Ch. GD, GDU, GH, GHU)

FOLDER 2

SET 397 FOLDER 2

TUNER **PARTS LIST AND DESCRIPTIONS**

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amplifier	6BQ7A	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	6AT8A	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No..	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	OLYMPIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	12			NPO-DI 12	TCZ-12	C10Q12C	TCO-12			NPO 10%
C202	47			NPO-DI 47	DD-470	L10Q47	ED-47		MS-447	10%
C203	2.7									10%
C204	2.2									NPO 10%
C205	1000			EF-001	MFT-1000				503C-D1	
C206	2.7									NPO 10%
C207	1.5				TCZ-1R5		TCO-1.5			±.25mmf
C208	800			BPD-0008	DD-801	L10T8	ED-0008		5GA-T8	
C209	800			BPD-0008	DD-801	L10T8	ED-0008		5GA-T8	
C210										
C211	50			DI -00005	DD-500	L10Q5	ED-50	UC-545	5GA-Q5	
C212	39			DI-000039	DD-390	L10Q39	ED-39	UC-5439	5GA-Q39	
C213	2					C10V2C				
C214										
C215	.39									
C216	1000			EF-001	MFT-1000				503C-D1	
C217	5			NPO-DI 5	DD-050	L10V5	ED-5	ZT-555	5TCCB-V5	10%
C218	1000			EF-001	MFT-1000				503C-D1	
C219	1000			EF-001	MFT-1000				503C-D1	
C220	6.8			NPO-DI 6.8	DTZ-6R8	L10V68	TCO-6.8	ZT-5568	5TCCB-V68	10%
C221	10			NPO-DI 5	DTZ-10		TCO-10			NPO 5%
C222	2.2			NPO-SI 2.2	TCZ-2R2	CTA6V22C	TCO-2.2		5TCCB-V22	
C223	1.5									N2200
C224	800			BPD-0008	DD-801	L10T8	ED-0008		5GA-T8	
C225	1000			EF-001	MFT-1000				503C-D1	
C226	800			BPD-0008	DD-801	L10T8	ED-0008		5GA-T8	

RESISTORS

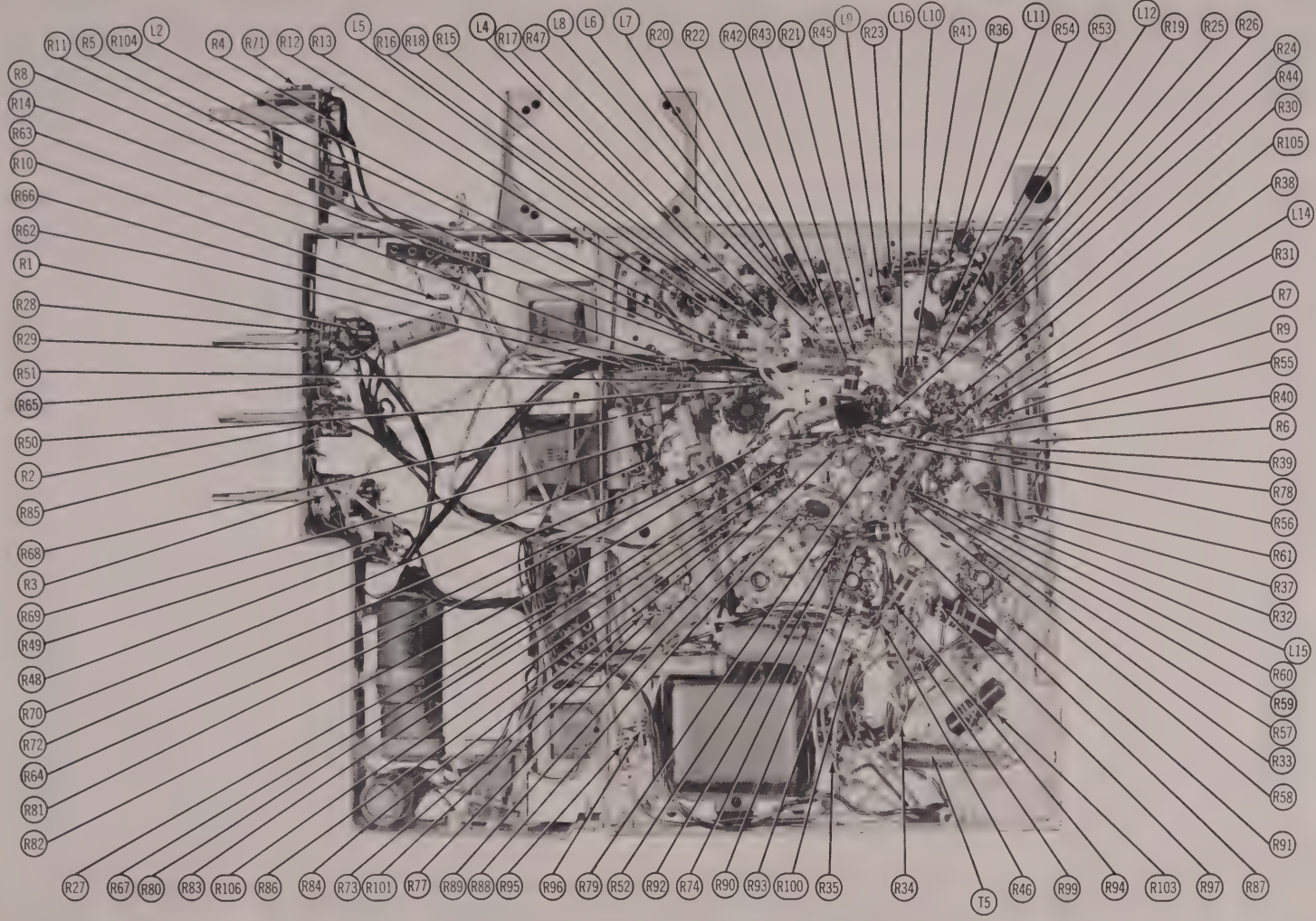
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		OLYMPIC PART No.	NOTES
	OHMS	WATT		
R201	180Ω			
R202	470Ω			
R203	180Ω			
R204	470Ω			
R205	680K			
R206	10K			
R207	1.5meg			
R208	1meg			
R209	1000Ω			

ITEM No.	RATING		OLYMPIC PART No.	NOTES
	OHMS	WATT		
R210	270Ω			
R211	2200Ω			
R212	33K			
R213	100K			
R214	1800Ω			
R215	4700Ω			
R216	15K			
R217	4700Ω			
R218	15Ω			

MISCELLANEOUS

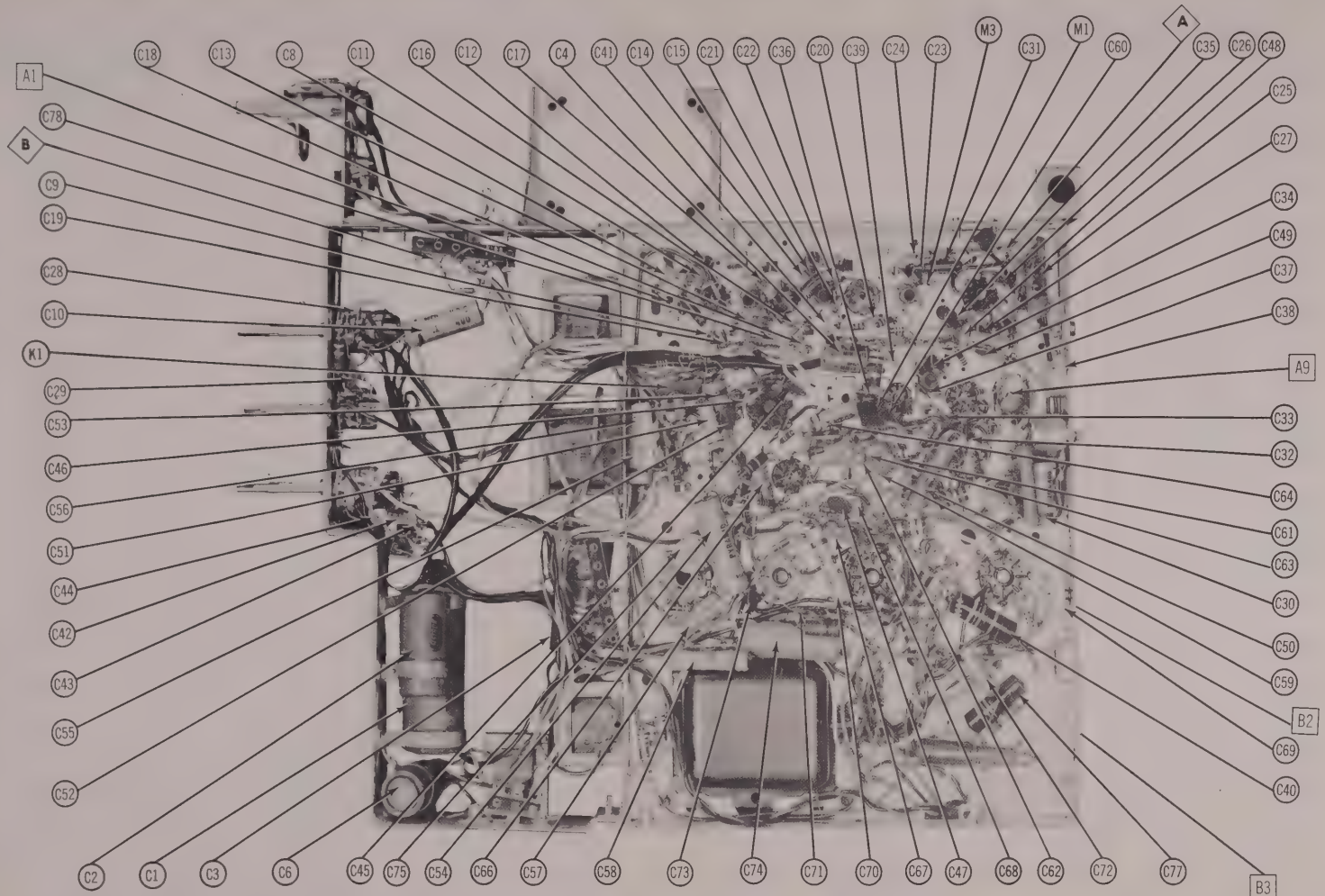
ITEM No.	PART NAME	OLYMPIC PART No.	NOTES
M201	Switch	SW2966-1	Distant-Local, DPDT, Slide type



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

OLYMPIC MODELS CD108, U, CD109, U, CD110P, PU, CH402, U, KD118, U, KD119, U, KD120, U, KH406, U, KH407, U, TD102, U (CH, GD, GDU, GH, GHU)

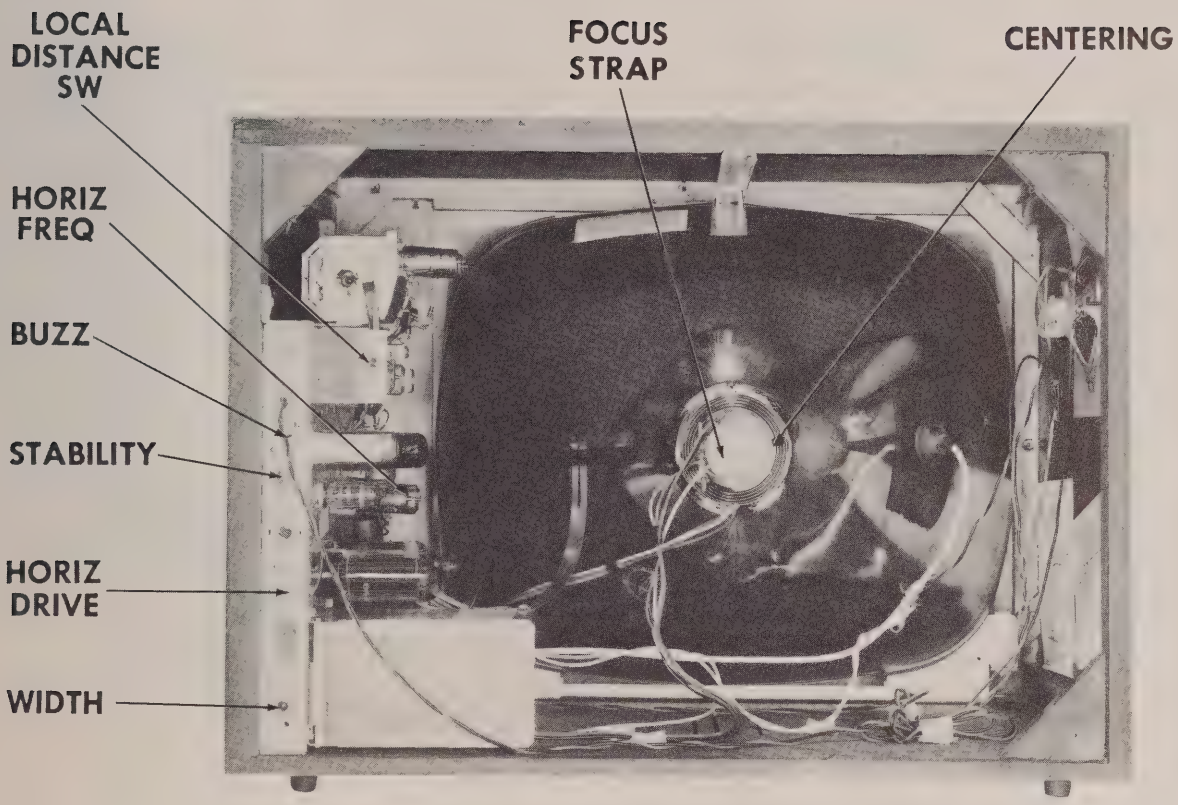
FOLDER 2



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

OLYMPIC MODELS CD108, U, CD109, U, CD110P, PU, CH402, U, KD118, U, KD119, U, KD120, U, KH406, U, KH407, U, TD102, U (Ch. GD, GDU, GH, GHU)

FOLDER 2



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a station, preferably with a test pattern.

Set the horizontal hold control to the center of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer (B2) counter clockwise as far as possible without the presence of vertical white lines or compression near the center of the screen.

Adjust the width slug (B3) for a picture SLIGHTLY wider than necessary to fill the picture mask horizontally.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	1st Video IF Amp	6BZ6	
V2	2nd Video IF Amp	6BZ6	
V3	3rd Video IF Amp	6CB6	
V4	Video Output-Noise Inv	6AW8A	
V5	Sound IF Amp -Sync Sep	6L8	
V6	Audio Det	6BA6	
V7	Audio Output	6W6GT	6DG6GT*
V8	Vert. Sync Amp - Horiz. Sync Amp	12AL7	

ITEM No	USE	TYPE	NOTES
V9	Vert. Mult -Vert. Output	12BH7A	
V10	Horiz. Mult	6CG7	
V11	Horiz. Output	6DQ8	
V12	Damper	6AX4GT	
V13	HV Rectifier	1B3GT	
V14	LV Rectifier	5U4G	

* Alternate

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	OLYMPIC PART No.	GENERAL ELECTRIC PART No	RCA PART No.	SYLVANIA PART No.	
V15	21CBP4A		21CBP4-A 1	21CBP4	1) "Silvarama" 3)
			21CBP4A 2)	21CBP4A 2)	2) "Silver Screen 85"
	24AEP4		24AEP4 1	24AEP4 2	

ELECTROLYTIC CAPACITORS

ITEM No	RATING			REPLACEMENT DATA					
	CAP	VOLT	OLYMPIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No
C1A	60	350	CO3380-1	PR3-025	BBRT0335	WT460		D-190	*R2S10
B	80	350						MT-4504	
C	4	350							
C2	50	450	CO3068-3	PRS250V50	BR5025	TC59	TD-50-450	MT-4550	TVA-1713
C3A	60	200	CO3856	PR3-200	BBRD0567	WD640		T-S17	*R1064
B	125	50						MT-05100	
C4	4	50	CO2756	PRS150V4	BBR4-50	TC30	TD-4-50	MT-05004	TVA-1402
C5	10	450	CO4021-2	PRS450V10	BR1045	TC78	TD-10-450	MT-4510	TVA-1705
C6	10	450	CO4021-2	PRS450V10	BR1045	TC78	TD-10-450	MT-4510	TVA-1705

* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING		REPLACEMENT DATA						NOTES
	CAP	VOLT	OLYMPIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C7	15		CO2850K	NPO-DI 15	DYZ-15	CD15E5C	TCO-15	DC5E1	5TCC-Q15	NPO 10%
C8	1000		CCD102M	BPD-001	DD-102	BYA5D1	ED-001	DC5D1	5HK-D1	
C9	1000		CCD102M	BPD-001	DD-102	BYA5D1	ED-001	DC5D1	5HK-D1	
C10	1	600		P488N-1	DF-104	CU84P1		GEM-401	4TM-P1	
C11	330		CCD331K		L10T33	BA5E1D	ED-330	UC-5333	MS-333	10% ③
C12	1000		CCD102M	BPD-001	DD-102	BYA5D1	ED-1000	DC5D1	5HK-D1	
C13	1000		CCD102M	BPD-001	DD-102	BYA5D1	ED-1000	DC5D1	5HK-D1	
C14	68		CO5208		TC2-R68		TCO-.68			10%
C15	8 8		CO447C	NPO-81 8 8	DYZ-8S8	C10V68C	TCO-8.6	ET-5568	TCC8-V86	10% ②
C16	1000		CCD102K		1R5D1		ED-1000		MS-21	10%
C17	1000		CCD102M	BPD-001	DD-102	BYA5D1	ED-1000	DC5D1	5HK-D1	
C18	1000		CCD102M	BPD-001	DD-102	BYA5D1	ED-1000	DC5D1	5HK-D1	
C19	1000		CCD102M	BPD-001	DD-102	BYA5D1	ED-1000	DC5D1	5HK-D1	
C20	1000		CCD102K			1R5D1	ED-1000		MS-21	10%
C21	1000		CCD102K			1R5D1	ED-1000		MS-21	10%
C22	1000		CCD102M	BPD-001	DD-102	BYA5D1	ED-1000	DC5D1	5HK-D1	
C23	8 8			NPO-81 8 8	DYZ-8S8	C10V68C	TCO-8.6	ET-5568	5TCC8-V86	
C24	4 7		CO1083	NPO-81 4.7	TCZ-4R7	CTA5V47C	TCO-4.7	ET-5547	5TCCB-V47	
C25	047	400		P488N-047	DF-503	CU84S47		GEM-4147	4TM-S47	
C26	330		CCD331M	BPD-00033	DD-331	L10T33	ED-330	UC-5333	5GA-T33	
C27	330		CCD331M	BPD-00033	DD-331	L10T33	ED-330	UC-5333	5GA-T33	
C28	330		CCD331M	BPD-00033	DD-331	L10T33	ED-330	UC-5333	5GA-T33	
C29	20000		CCD203K	BPD-03	DD-203	BYB5E2	ED-02		5HK-S2	
C30	1	400		P488N-1	DF-104	CU84P1		GEM-401	4TM-P1	
C31	20000		CCD203K	BPD-02	DD-203	BYB5E2	ED-02		5HK-S2	
C32	5000		CCD502K	BPD-005	DD-502	BYA1D5	ED-005	DC5E5	5HK-D5	
C33	5000		CCD502K	BPD-005	DD-502	BYA1D5	ED-005	DC5E5	5HK-D5	
C34	5000		CCD502K	BPD-005	DD-502	BYA1D5	ED-005	DC5E5	5HK-D5	
C35	1000		CCD102K			1R5D1	ED-1000	MCB2S5	MS-21	10%
C36	5000		CCD502K	BPD-005	DD-502	BYA1D5	ED-005	DC5E5	5HK-D5	
C37	5000		CCD502K	BPD-005	DD-502	BYA1D5	ED-005	DC5E5	5HK-D5	
C38	1000		CCD102K			1R5D1	ED-1000	MCB2S5	MS-21	10%
C39	470		CCD471K			BR5Y47	ED-470		MS-347	10%
C40	047	600		P488N-047	DF-503	CU84S47		GEM-4147	4TM-S47	
C41	47		CCD470J		DYZ-47		TCC-47			NPO 5%
C42	5000		CCD502K	BPD-005	DD-502	BYA1D5	ED-005	DC5E5	5HK-D5	
C43	470		CCD471K		D5-471	5R5T47	ED-470		MS-347	10%
C44	2000		CCD202M	BPD-002	DD-202	BYA5D1	ED-002	DC5E5	5HK-D2	
C45	5000		CCD502K	BPD-005	DD-502	BYA1D5	ED-005	DC5E5	5HK-D5	
C46	10000		CCD103M	BPD-01	DD-103	BYA5E1	ED-01	DC5I1	5HK-S1	
C47	10000		CCD103M	BPD-01	DD-103	BYA5E1	ED-01	DC5I1	5HK-S1	
C48	002	600		P488N-002	DS-202	CU84D2	GP-4000	GEM-622	4TM-D2	
C49	220		CCD22K		D5-221	5R5T22	ED-220		MS-322	10%
C50	047	600		P488N-047	DF-503	CU84S47		GEM-4147	4TM-S47	
C51	0047	600						GEM-16147		10%
C52	10000		CCD103M	BPD-01	DD-103	BYA5E1	ED-01	DC5I1	5HK-S1	
C53	035	600		P488N-033		CU84S33		GEM-4133	4TM-S33	
C54	22	200		P288N-22		CUB2P22		GEM-2122	2TM-P22	
C55	1	400		P488N-1	DF-104	CU84P1		GEM-401	4TM-P1	
C56	01	1000		P1088N-01	DD16-103	CUB10S1		GEM-1101	10TM-S1	
C57	02	400		P488N-02	DD-203	CU84S2		GEM-414	4TM-S2	
C58	047	400		P488N-047	DF-503	CU84S47		GEM-4147	4TM-S47	
C59	100									N750 1%
C60	100		CCD101K	N750-DI 100	DYN-100	C10T1U	TCN-100	NT-531	5TCU-T1	N750 10%
C61	1000		CCD102K			1R5D1	ED-1000	MCB2S5	MS-21	10%
C62	1000		CCD102K			1R5D1	ED-1000	MCB2S5	MS-21	10%
C63	1	200		P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C64	047	600						GEM-16147		10%
C65	3900		CO5466	1464-0039		1R5D39		MS-239		10%
C66	001	600		P488N-001	DS-102	CUB6D1	GP-1000	GEM-621	6TM-D1	10%
C67	680			1464-00068	D5-681	1R5T68	ED-680		MS-368	10%
C68	.001	600						GEM-1621		10%
C69	110-									
	580		CT3S48							
C70	047	600		P488N-047	DF-503	CU84S47		GEM-4147	4TM-S47	
C71	470	1000	CO5467							10%
C72	001	600						GEM-1621		10%
C73	10000		CCD103M	BPD-01	DD-103	BYA5E1	ED-01	DC5I1	5HK-S1	

CAPACITORS (cont)

ITEM No	RATING		REPLACEMENT DATA						NOTES
	CAP	VOLT	OLYMPIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C74	22	400		P488N-22		CUB4P22		GEM-4022	4TM-P22	
C75	100	3000	CO4520							10% 3.
C76	68	3000		P888N-047	DF-503	CUB6S47		GEM-4147	6TM-S47	10%
C77	047	600		BPD-001	DD-102	BYA5D1	ED-1000	DC5D1	5HK-D1	
C78	1000									

1) Some versions use 1000mmf 10% (Part #CCD103K) in this application.
2) Some versions use 33mmf, 47mmf or 68mmf in this application. Replace with original value.
3) Some versions use 150mmf @ 3000V (Part #CO3380) in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA						INSTALLATION NOTES
	RESISTANCE	WATTS	OLYMPIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.		
R1A	1500Ω	½	PTK3666				U22258		Contrast
B	1meg	½					Not Req.		Volume
C	Switch	½					Not Req.		
R2A	1meg	½	PTK3704	F1-51			U22598		Horiz. Hold
B	2meg	½	PTK3715	R2-57		* (GJ-966 ①)	* (U23596		Vert. Hold
R3A	1meg	½	PTK3715				U23598		Brightness
B	500K	½					Not Req.		Tone
C	Switch	½					Not Req.		
R4A	5000Ω	½	PTK3619-2	AB-10	A47-5000-S	Q1-114	TA33L		Vert. Lin.
B	Shaft	½		AK-1	FK3-1/4	TQ	Not Req		
R5A	2.5meg	½	PTK3008-1	AB-23	A47-2.5meg-S	Q1-139	TA35L		Height
B	Shaft	½		AK-1	FK3-1/4	TQ	Not Req.		
R6A	1meg	½	PTK3534	AB-75	A47-1meg-S	Q1-139	U36		Stability
B	Shaft	½		AK-1	FK3-1/4	TQ	Not Req.		
C	Switch	½		KB-1 or KR-1*	SWF-13	76-1	US-26		
R7	400Ω	2(WW)	PT361		39-500		FL-600		Buzz

* "Concentrik" Equivalent:K-8 KH, Base Elements & Shafts RH-137, P17-18 (Panel) RH-130, RI-130 (Rear)

● STA-LOC" Equivalent: FA16L, OS1500, RU26L, ES2000
* Use KR on Cri. "red label" controls, KB on "blue label" controls.
① Not available as a factory assembled control.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		OLYMPIC PART No.	NOTES
	OHMS	WATT		
R8	3300Ω	1		
R9	56K			
R10	470K			
R11	15K			
R12	330Ω			
R13	47Ω			
R14	1000Ω			
R15	33K			
R16	1000Ω			
R17	330Ω			
R18	47Ω			
R19	47K			
R20	4700Ω			
R21	330Ω			
R22	18K			
R23	12K			
R24	3900Ω			
R25	1meg			
R26	1.5meg	3		
R27	47K			
R28	1800Ω			
R29	33Ω	1		
R30	47K			Note 1
R31	15K			
R32	6800Ω	4	RE5633	
R33	150K			
R34	10K			
R35	33K			
R36	1meg			
R37	2.5MΩ			
R38	100K			
R39	47K			
R40	6800Ω			
R41	1000Ω			
R42	1000Ω			
R43	3300Ω	2		
R44	150Ω			
R45	330K			
R46	330K			
R47	47K			
R48	100K			
R49	100K			
R50	1meg			
R51	1meg			
R52	1.5meg			
R53	470K			
R54	2.2meg			
R55	82K			
R56	82K			
R57	47K	2		

ITEM No.	RATING		OLYMPIC PART No.	NOTES
	OHMS	WATT		
R58	56K			
R59	56K			
R60	82K			
R61	2700Ω			
R62	47K			
R63	82K			
R64	680K			Note 2
R65	470K			
R66	12K			
R67	47K			
R68	1meg	1		Note 3
R69	1.5meg			
R70	1.5meg			
R71	560Ω			
R72	150K			
R73	2700Ω			
R74	1000Ω	2		
R75	560Ω			
R76	560Ω			
R77	560K			
R78	680K			Note 2
R79	100K			
R80	1meg			
R81	82K			
R82	6800Ω	1		
R83	820Ω 5%			
R84	1meg			
R85	330K			
R86	220K			
R87	3300Ω	2		
R88	820Ω			
R89	82K			
R90	470K			
R91	47K			
R92	47Ω			
R93	3300Ω	2		Note 4
R94	5600Ω	2		
R95	330K	1		
R96	330K	1		
R97	47K			
R98	33Ω	1		
R99	150K			
R100	150K			
R101	4700Ω			
R102	3.3Ω	1	RE4419	
R103	100K	1		
R104	330Ω			Note 5
R105	68K			Note 5
R106	68K			

Note 1. Some versions use 22K in this application.
Note 2. Some versions use 620K in this application.
Note 3. Some versions use 1.5meg in this application.
Note 4. Some versions use 5600Ω 2W in this application.
Note 5. Not used in some versions.

TRANSFORMER (POWER)

ITEM No	RATING			REPLACEMENT DATA						NOTES
	PRI.	SEC. 1	SEC. 2	OLYMPIC PART No.	Halldorson PART No	Merit PART No	Ram PART No	Stancor PART No.	Thordorson PART No	Triad PART No.
T1	117VAC @ 1 4A	550VCT @ .220A	5VAC @ 3A	TR3621-3					26R88	R-64BC
		SEC. 3	SEC. 4	SEC. 5						
		6.3VAC @ 8.5A								

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							NOTES
		OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No	Stancor PART No.	Thordorson PART No	Triad PART No.	
T2	Vert. Output	TR-3888	22800 ①	A-3089	V313	A-8241	26B75	A-40BX	
	Alt. Vert. Output	TR3S82-3		② ③	② ③	② ③	1	2	
	Alt. Vert. Output	TR3657							
T3A	Yoke-Horiz. (68MH)	CL-3800-4	DF807	MDF-82	Y90P18/43	DY-86A	Y-16	Y-41 & NW	
B	(90°)-Vert. (60MH)		④ ⑤	③ ④	④ ⑤	④ ⑤	③ ④	NW3 5'	
M6	Rear Cover & Centering Device	PP5840							
	Yoke Clamp	SP5674							
T4	Horiz. Output	TR-3598-5A				X1A1 *		D-120 *	
	Alt. Horiz. Output	TR-3598-5				X1B1 *		D-120 *	
T5	Width Coil (1.5-6MH)	CL5402	RF800 ⑥	MWC-6	20LR13	WC-8	WC-32	WLC-5	

① Use 18 to 1 turns ratio.
② Remove pin #1 of yoke socket from ground. Connect red lead to junction of C6, R5 and R74, and to pin #7 of yoke socket. Connect green lead to pin #6 of yoke socket.
③ Drill new mounting hole(s).
④ Use original yoke damping network, if necessary.
⑤ Connect same as original and use original rear cover and centering device.
⑥ Use terminals #3 and #4.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordorson Replacement Connections	Triad Replacement Connections
9			9			9
8			8			8
6			6			7
3			4			YCT
2			3 & 2			3 & 2
1			1			1
Connect Width Coil Across	2 & 1		2 & 1			2 & 1

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No	Stancor PART No.	Thordorson PART No.	Triad PART No
T6	2800Ω	8-8Ω	TR3S367						

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V C IMP	OLYMPIC PART No.	QUAM PART No.	
SP1	3½"	PM	3-4Ω	SK2S463 ①	3A1Z4.3	① Used in Models CD108, U, 109, U, 110P, PU, KD118, U,
SP2	4"	PM	3-4Ω	SK4342 ②	4A07	119, U, 120, U, TD102 U
	6"	PM		SK1908 ③		② Used in Models TD103, U
	8'	PM		SK1906-2 ④		③ Used in Models KD120, U
	6"x9"	PM		SK3738 ⑤		④ Used in Models CD109, U, 108, U, 110P, PU, CH403, U
	8"	PM		SK3S81 ⑤		⑤ Used in Models KD118, U,119, U, 120, U

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		OLYMPIC PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No	
L1	47.25MC Trap	CL5837					
L2	RF Choke		19-1006				18 Microhenries
L3	1st. Video IF	CB4806-1		TV-129			Includes 47.25MC Trap①
L4	Fil. Choke	CL2427	19-1001	BC-562	4604		1.5 Microhenries
L5	2nd. Video IF	CL4531	17-4523	TV-130	6219	VF-3	
L6	Fil. Choke	CL2427	19-1001	BC-562	4604		1.5 Microhenries
L7	47.25MC Trap	CL4753					
L8	3rd. Video IF	CL4531	17-4523	TV-130	6219	VF-3	
L9	4th. Video IF	CL4531	17-4534	TV-130	6219	VF-3	
L10	Resonant Choke	CK5415					6.8 Microhenries ②
L11	Series Peaking Coil	CL3856	19-3180 *	TV-184 *	6180 *	VP-5 *	180 Microhenries, wound on 12K resistor
L12	Shunt Peaking Coil	CL1537	19-4180	TV-183	6179	VP-5 ▲	180 Microhenries, wound on 39K resistor
L13A	4.5MC Trap	TR3386-1					
B	1st. Sound IF						
L14	Series Peaking Coil	CL5827	19-3300 *	TV-199 *	6155 *		300 Microhenries, wound on 12K resistor
L15	Shunt Peaking Coil						750 Microhenries, wound on 1meg resistor
L16	2nd. Sound IF	CL5708					
L17	Quadrature Coil	CL3803-1			1481	SD-6	
L18	RF Choke	CK5415	19-1004	BC-565	4610		6.8 Microhenries

* Parallel with a 12K resistor.
▲ Parallel with a 39K resistor.
① Alternate part #CL4806-1.
② Some versions may use 1.7 microhenries choke in this application.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA						NOTES
	PRI.	SEC.	OLYMPIC PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordorson PART No.	
L19	52Ω		CL5464 *	19-1578	TV-183	6210	H-102	H3-5	* Alternate part #CL5464-1

OLYMPIC MODELS CD108, U, CD109, U, CD110P, PU, CH402, U, KD118, U, KD119, U, KD120, U, KH406, U, KH407, U, TD102, U (CH. GD, GDU, GH, GHU)

FOLDER 2

PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L20 L21	.220A .060A	62Ω 52Ω	.7 Hy. 1.1 Hy.	CK4047 CK25465	C5030 ①			C-2325 ①	26C43 ①	C-24X ①

① Drill new mounting hole.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	OLYMPIC PART No.	REPLACEMENT DATA	
K1	Vert. Integrator	2000mmf, 5000mmf, 5000mmf, 22K, 8200Ω, 8200Ω	PC2435	Aerovox Centralab Cornell-Dubilier Erie Sprague	PA-110 PC-104 115TM1 1405-01 V-1

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	OLYMPIC PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1		RF5465 ①	1215 ①②		1T1 ①②		① Selenium type. ② Two required.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			OLYMPIC PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	C	3/8A 250V	FU4345	FH4344	332.375 (C 3/8A-250V)	346002	C 3/8	HC 3/10 to 1/2

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		OLYMPIC PART No.	CBS PART No.	SYLVANIA PART No.	
M3	1N60 *		1N60	1N60	Video Det. (Pigtail)

* A 1N64 may be used in some versions.

MISCELLANEOUS

ITEM No.	PART NAME	OLYMPIC PART No.	NOTES
M4	Lamp	BU187	#47
M5	Tuner	CL5661	VHF - Ch. GH, GD
	Tuner	CL5662	UHF-VHF - Ch. GHU, GDU
M6	Centering Device	PP5640	Includes yoke rear cover

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	PP3656-1	21" Models
Safety Glass	PP3939-1	24" Models
Mask	PP3646-2	21" Models
Mask	PP3938	24" Models
Knob	KN5852-2	Contrast, brightness, horiz.
Knob	KN5853-2	On-off-volume, vert.
Knob	KN5886-2	Tone
Knob	KN5899-2	Push
Knob	KN25357	Radio volume - Models KD118, U, 119, U, 120, U
Knob	KN25359	AM/Phono-TV - Models " "
Knob	KN25360	On-off-tone - Models " "

FOR ALL CHANNEL SELECTOR KNOBS ORDER BY SPECIFING FUNCTION, COLOR & TUNER PART NUMBER.

WIRING DATA

High Voltage Lead ..... Use BELDEN No. 8869
Shielded Hook-up Wire ..... Use BELDEN No. 8885 (Single Conductor)
8738 (Two Conductor)
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type) ..... Use BELDEN No. 8874
300Ω Tuner Input Lead ..... Use BELDEN No. 8225
300Ω Antenna Lead-in ..... Use BELDEN No. 8230 or 8275
Antenna Rotor Cable ..... Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor
8485 (Round) - 5 Conductor
8488 (Round) - 8 Conductor

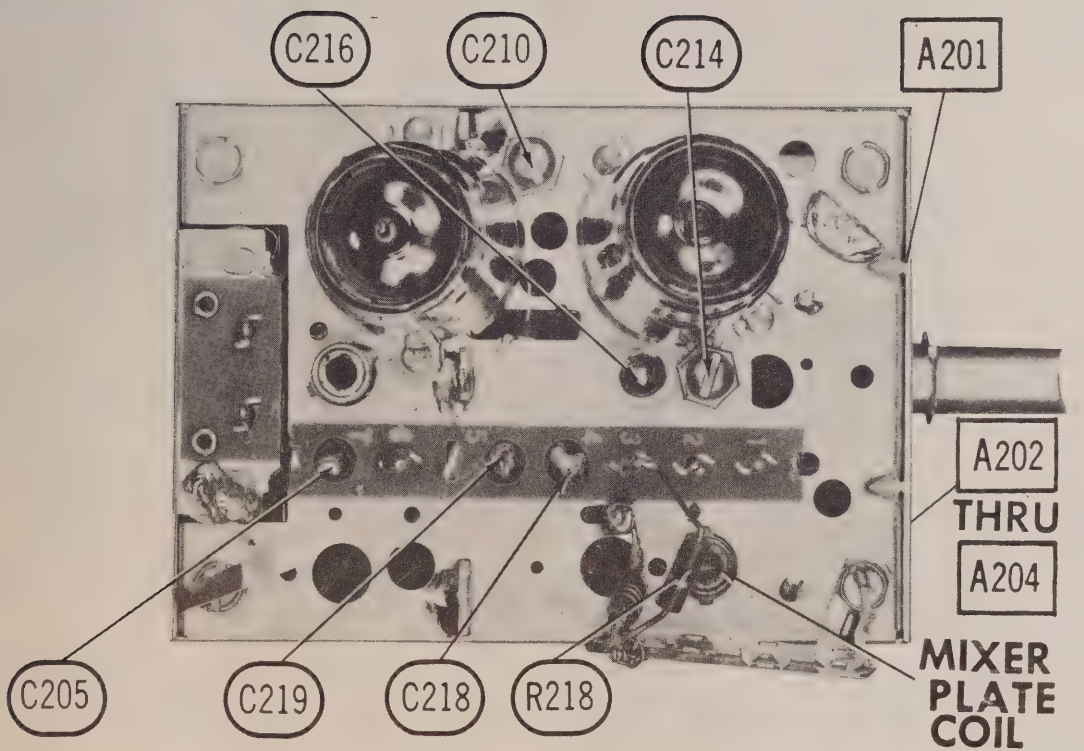
TUNER ALIGNMENT INSTRUCTIONS

VHF OSCILLATOR ALIGNMENT

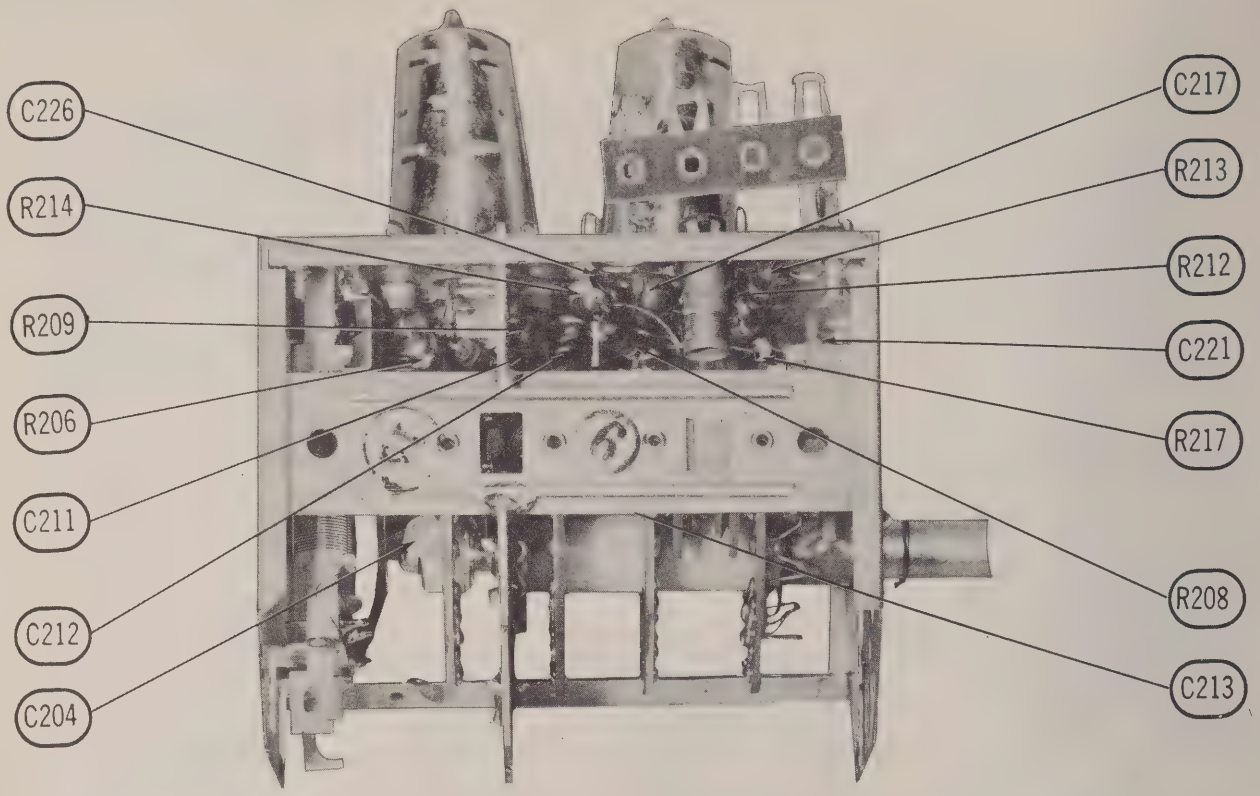
Channel 13 oscillator adjustment slug (A201) is also used for adjusting the other high band channels 12 thru 7. Channel 6 oscillator adjustment slug (A202) is also adjusted for channel 5. Channel 4 oscillator adjustment (A203) is also adjusted for channel 3. Channel 2 oscillator slug (A204) is used for channel 2 only.
Turn the set on and tune in the highest high band channel and adjust controls for normal operation. Set fine tuning to the center of its range. Adjust A201 for best picture and sound. Switch to next high band channel. If necessary to adjust, do so by bending coil loop appearing at the hole to left of tuner shaft. Adjust for best picture and sound. Check adjustment of all high band channels in descending order. Switch channel selector to the highest low band channel 6 thru 2 operating in the area. Adjust proper slug for best pictur e and sound. If channel 5 or 3 require adjusting, it will be necessary to switch to the next higher channel, adjust slug SLIGHTLY, then switch back to the channel needing adjustment and check picture. Repeat until proper results are obtained. Repeat procedure until all channels operating in the area have been properly adjusted.

RF AND MIXER ALIGNMENT

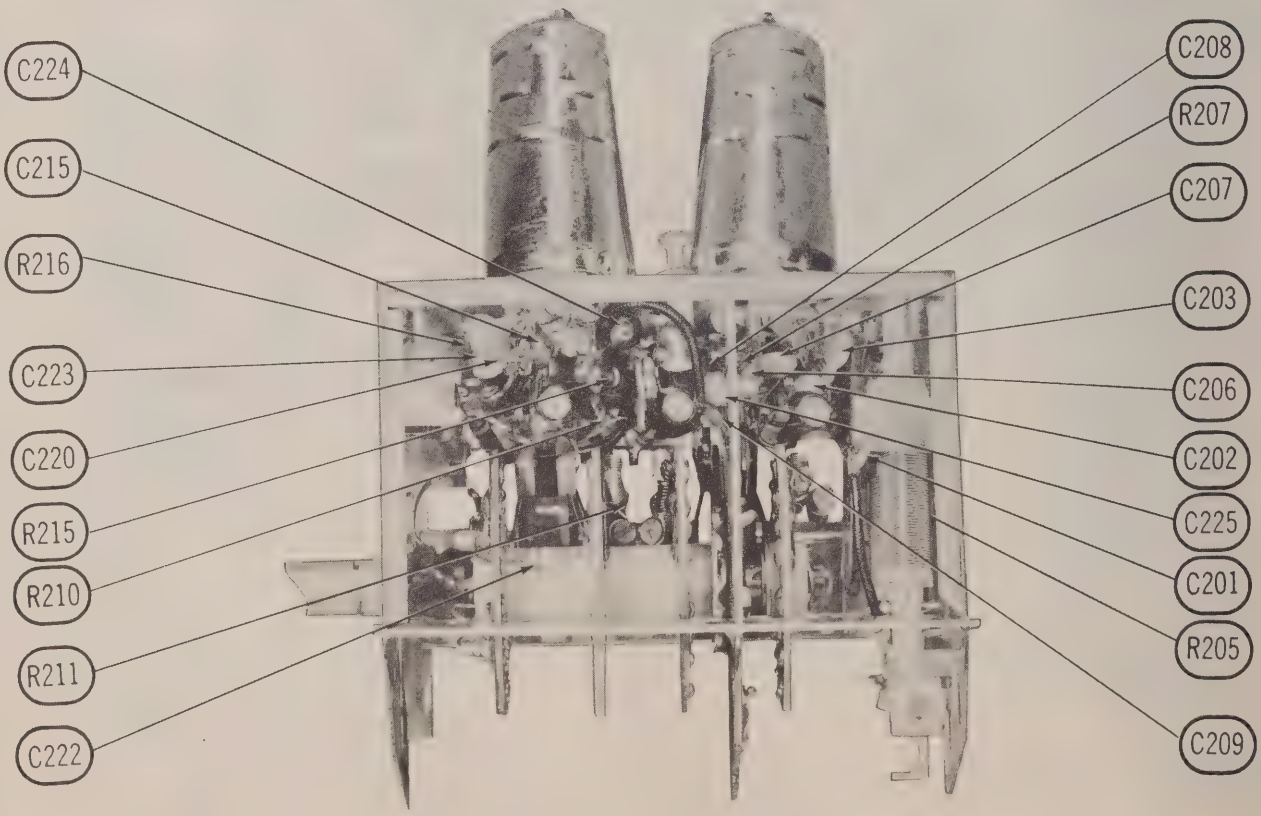
This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.



TUNER—TOP VIEW



TUNER-LEFT SIDE



TUNER-RIGHT SIDE

CHASSIS TOP VIEW

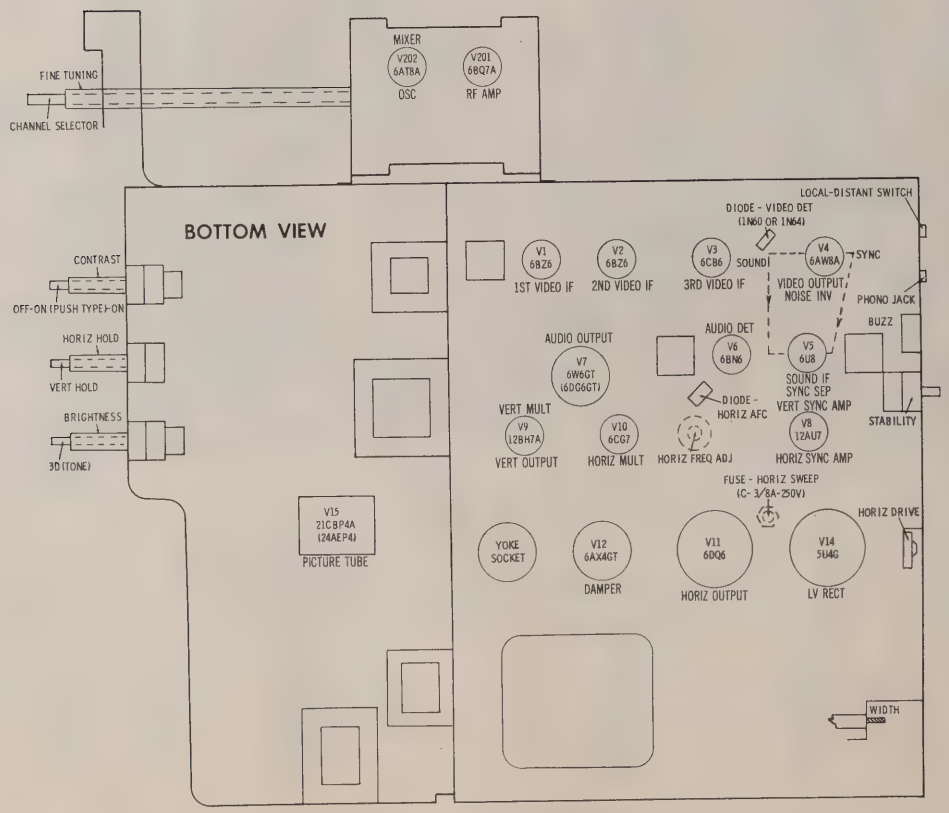
OLYMPIC MODELS CD108, U, CD109, U, CD110P, PU, CH402, U, KD118, U, KD119, U, KD120, U, KH406, U, KH407, U, TD102, U (Ch. GD, GDU, GH, GHU)

FOLDER 2

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BZ6	55K	47Ω	.1Ω	0Ω	▪ 660Ω	▪ 660Ω	0Ω		
V2	3BZ6	55K	47Ω	.1Ω	0Ω	▪ 660Ω	▪ 660Ω	0Ω		
V3	3CB6	.1Ω	180Ω	.1Ω	0Ω	▪ 660Ω	▪ 660Ω	0Ω		
V4	6AW8A	3900Ω	•2.3meg	†55K	.1Ω	0Ω	•270Ω	500K	†47K	†6800Ω
V5	6U8	▪ 33K	100K	▪ 20K	.1Ω	0Ω	†1000Ω	0Ω	0Ω	2.7meg
V6	6BN6	•210Ω	2.6Ω	.1Ω	0Ω	▪ 3300Ω	7.5Ω	‡660K		
V7	6W6GT	0Ω	0Ω	†230Ω	†52Ω	500K	TP	.1Ω	17K	
V8	12AU7	†27K	100K	2700Ω	.1Ω	.1Ω	†28K	0Ω	2700Ω	0Ω
V9	12BH7A	‡2500Ω	1.5meg	•2700Ω	0Ω	0Ω	‡1.5meg	•1.5meg	47K	.1Ω
V10	6CG7	†10K	1.4meg	820Ω	0Ω	.1Ω	†82K	68K	820Ω	0Ω
V11	6DQ6	0Ω	0Ω	NC	†8900Ω	400K	TP	.1Ω	0Ω	TOP CAP ‡53Ω
V12	6AX4GT	NC	NC	¶	NC	†0Ω	NC	0Ω	.1Ω	
V13	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡583Ω
V14	5U4G	TP	¶	NC	25Ω	TP	27Ω	TP	¶	
V15	21CBP4A	0Ω	32K	PIN 6 ‡120K	PIN 10 †120K	PIN 11 •180K	PIN 12 .1Ω			
V201	6BQ7A	†4300Ω	580K	INF	.1Ω	0Ω	INF	470K	0Ω	0Ω
V202	6AT8A	15K	▪ 4700Ω	0Ω	0Ω	.1Ω	▪ 1800Ω	▪4700Ω	0Ω	133K

¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 270V SOURCE.
▪ MEASURED FROM 150V SOURCE.
‡ MEASURED FROM PIN 3 OF V12.
NC NO CONNECTION.
TP TIE POINT.



TUBE PLACEMENT CHART

PHOTOFACT* Folder

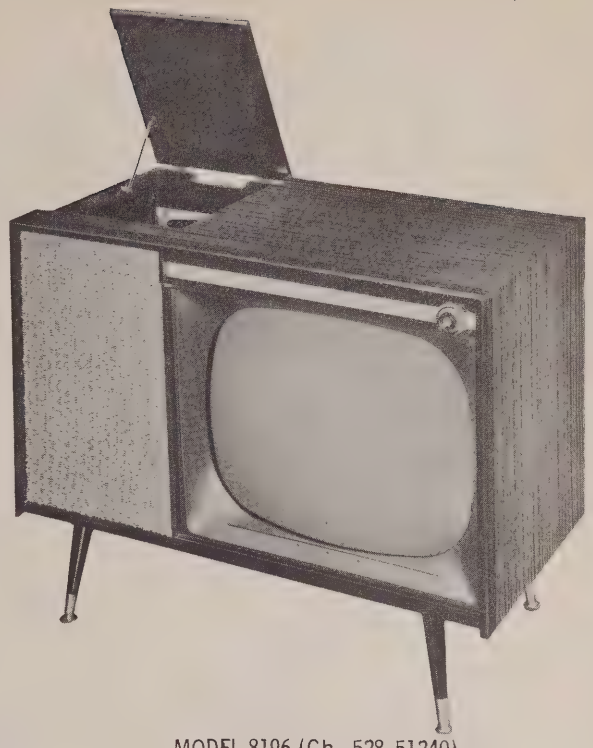
*TRADE MARK

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 8 push-on type control knobs from the front.
2. Remove 12 wood screws from the rear cover. Remove the rear cover.
3. Remove 2 wood screws holding the AC interlock.
4. Remove the picture tube socket, yoke plug, HV lead, phono plug and speaker leads.
5. Remove 4 wood screws holding the tuner bracket and control bracket to the cabinet.
6. Remove 2 wood screws holding the top chassis brace.
7. Remove 2 chassis bolts from the bottom.
8. Remove the chassis.



MODEL 8196 (Ch. 528.51240)

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS
Care should be exercised when connecting test equipment or physically contacting the chassis.

SILVERTONE CHASSIS 528.51106, 107, 108, 160, 161, 163, 164, 165, 166, 167, 168, 170, 171, 172, 173, 175, 180, 181, 183, 184, 185, 187, 190, 191, 193, 194, 240, 241, 242, 245, 250, 251, 253

TRADE NAME	Silvertone	MODELS	CHASSIS	MODELS	CHASSIS
		8114, 8116, 8154, 8156, 8158, 8182	528.51106	8160, 8162, 8184, 8186, 8188	528.51183
		8114, 8116, 8154, 8156, 8158, 8182	528.51107	8160, 8162, 8184, 8186, 8188	528.51184
		8114B	528.51108	8160, 8162, 8184, 8186, 8188	528.51185
		8114, 8116, 8154, 8156, 8158, 8182	528.51160	8160, 8162, 8184, 8186, 8188	528.51187
		8114, 8116, 8154, 8156, 8158, 8182	528.51161	8161, 8163, 8185, 8187	528.51190
		8114, 8116, 8154, 8156, 8158, 8182	528.51163	8161, 8163, 8185, 8187	528.51191
		8114, 8116, 8154, 8156, 8158, 8182	528.51164	8161, 8163, 8185, 8187	528.51193
		8114, 8116, 8154, 8156, 8158, 8182	528.51165	8161, 8163, 8185, 8187	528.51194
		8114, 8116, 8154, 8156, 8158, 8182	528.51166	8196, 8198	528.51240
		8114B	528.51167	8196, 8198	528.51241
		8114, 8116, 8154, 8156, 8158, 8182	528.51168	8196, 8198	528.51242
		8115, 8117, 8155, 8157, 8183	528.51170	8196, 8198	528.51245
		8115, 8117, 8155, 8157, 8183	528.51171	8197, 8199	528.51250
		8115, 8117, 8155, 8157, 8183	528.51172	8197, 8199	528.51251
		8115, 8117, 8155, 8157, 8183	528.51173	8197, 8199	528.51253
		8115, 8117, 8155, 8157, 8183	528.51175	7777 (Radio Unit)	528.53190*
		8160, 8162, 8184, 8186, 8188	528.51180	8196, 8197, 8198, 8199	528.56260**
		8160, 8162, 8184, 8186, 8188	528.51181	8196, 8197, 8198, 8199	528.56270**
		8160, 8162, 8184, 8186, 8188	528.51182	7775 (Remote Control Unit) *	

* Used with any TV Model

** Record Changer Chassis

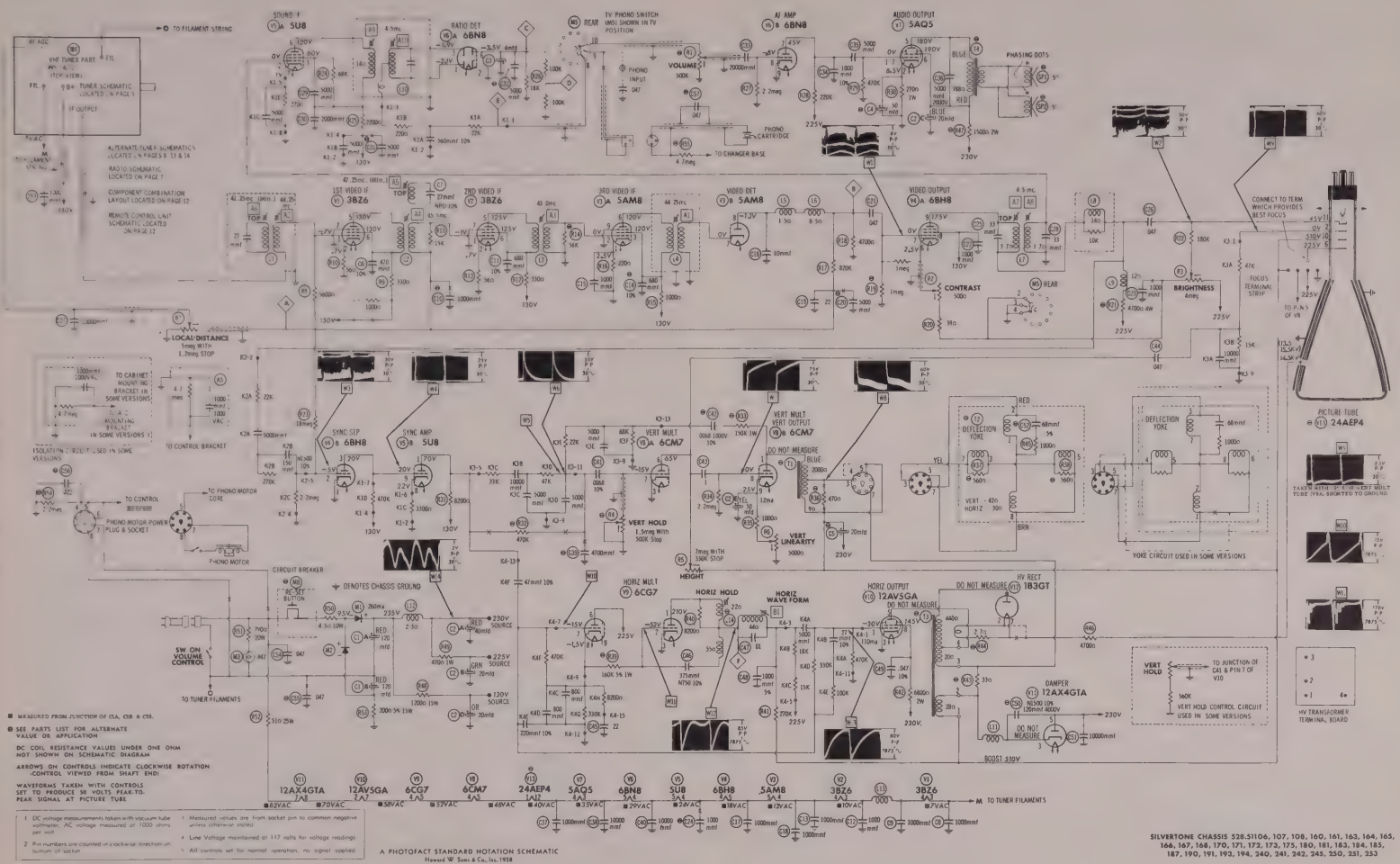
SUPPLIER	Sears Roebuck & Co., 925 S. Homan Avenue, Chicago, Illinois
TYPE SET	Combination Television Receiver And Phonograph
TUBES	Fifteen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 140 Watts, 1.2 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

FOR SERVICE INFORMATION ON RECORD CHANGERS REFER TO SIMILAR UNIT COVERED IN PHOTOFACT SET 374-FOLDER 4.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana . Printed in U.S. of America

H455

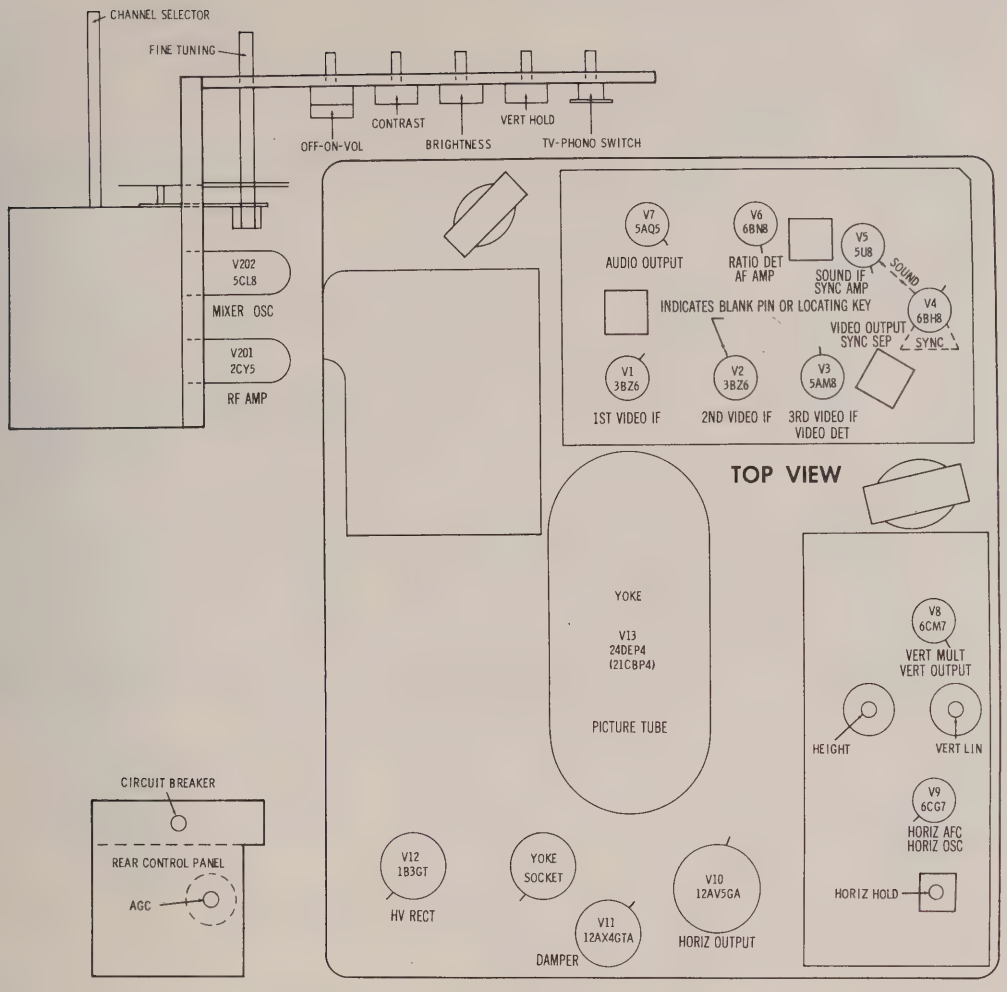


A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

SILVERTONE CHASSIS 528.51106, 107, 108, 160, 161, 163, 164, 165, 166, 167, 168, 170, 171, 172, 173, 175, 180, 181, 183, 184, 185, 187, 190, 191, 193, 194, 240, 241, 242, 245, 250, 251, 253

FOLDER 3

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

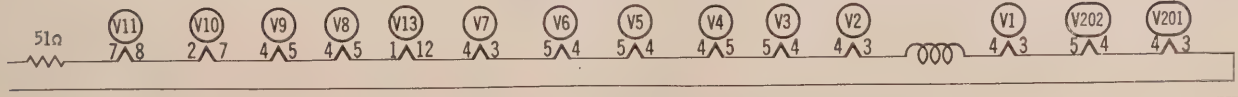
POWER SUPPLY FAILURE
No raster, no sound - **Circuit Breaker (M8), Rectifier (M1, M2)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V1, V2, V3, V4**
No pic, no sound, has snow - **V201, V202, V1**
No pic, has sound, has raster - **V4, V13**
Has pic, no sound - **V5, V6, V7**

SYNC FAILURE
No vert. sync - **V4, V5**
No horiz. sync - **V4, V5, V9**
No vert. or horiz. sync - **V4, V5**

SWEEP FAILURE
No raster, has sound - **V9, V10, V11, V12, V13**
No vertical deflection - **V8**
Poor vert. linearity or foldover - **V8**
Poor horiz. linearity or foldover - **V9, V10, V11**
Narrow picture - **V9, V10, V11, M1, M2**
Vert. off freq. - **V8**
Horiz. off freq. - **V9**

This receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative. (See circuit below.)



SILVERTONE CHASSIS 528.51106, 107, 108, 160, 161, 163, 164, 165, 166, 167, 168, 170, 171, 172, 173, 175, 180, 181, 183, 184, 185, 187, 190, 191, 193, 194, 240, 241, 242, 245, 250, 251, 253

FOLDER 3

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VIDEO IF ALIGNMENT

Short antenna terminals together.
Connect the negative lead of a 3 volt bias supply to point (A). Positive to chassis.
Detune A1, A4, A5, A6 and the Mixer Plate Coil by turning the cores almost out of the coil forms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	Place a thin insulated metal strip between the mixer-osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	44.25MC	Any non-interfering channel	DC probe thru 10K to point (B). Common to chassis. (Across video det. load).	A1, A2 & Mixer Plate Coil	Attenuate generator output to maintain not more than 2.5 volts on VTVM. Adjust for maximum deflection.
2.	"	"	43.0MC	"	"	A3	"
3.	"	"	45.5MC	"	"	A4	"
4.	"	"	47.25MC	"	"	A5	Increase generator output. Adjust A5 for MINIMUM deflection. Repeat steps 3 and 4.
5.	"	"	41.25MC	"	"	A6	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Short antenna terminals together.
Attenuate sweep generator output to maintain not more than 2 volts peak to peak on the scope (-3 volts DC at point (B)).
If separate marker generator is used, couple loosely to the sweep cable.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	Place a thin insulated metal strip between the mixer-osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	44.25MC (10MC Swp)	41.25MC 42.75MC 43.8MC 44.25MC 45.0MC 45.75MC 47.25MC	Any non-interfering channel	Vert. Amp. thru 10K to point (B). Low side to chassis. (Across video det. load).		Check for response similar to Fig. 1. Retouch Mixer Plate Coil if necessary to place 45.75MC marker at 50%. Retouch A1 for proper tilt.

SOUND IF ALIGNMENT

Connect two matched 100K (±1%) resistors in series from point (C) to chassis. The junction of these two resistors is alignment point (D) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.001mfd	High side to point (B). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe to point (C). Common to chassis.	A7, A8, A9	Adjust for maximum deflection.
8.	"	"	"	"	DC probe to point (E). Common to point (D).	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

4.5MC TRAP ALIGNMENT

Tune in a local TV station and check the picture for evidence of 4.5MC beat interference. If necessary, retouch A7 until the horizontal scanning lines are smooth and continuous.

RADIO ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator and chassis.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
9.	.1mfd	High side to pin 7 (grid) of converter (12BE6). Low side to chassis.	455KC (400∿ 30% AM)	Radio	Tuning gang fully open	Across voice coil	A12, A13, A14, A15	Adjust for maximum deflection.
10.	"	"	1620KC	"	"	"	A16	"
11.		Loop	1400KC	"	1400KC	"	A17	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 6.

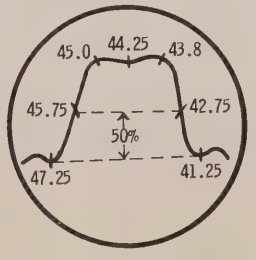
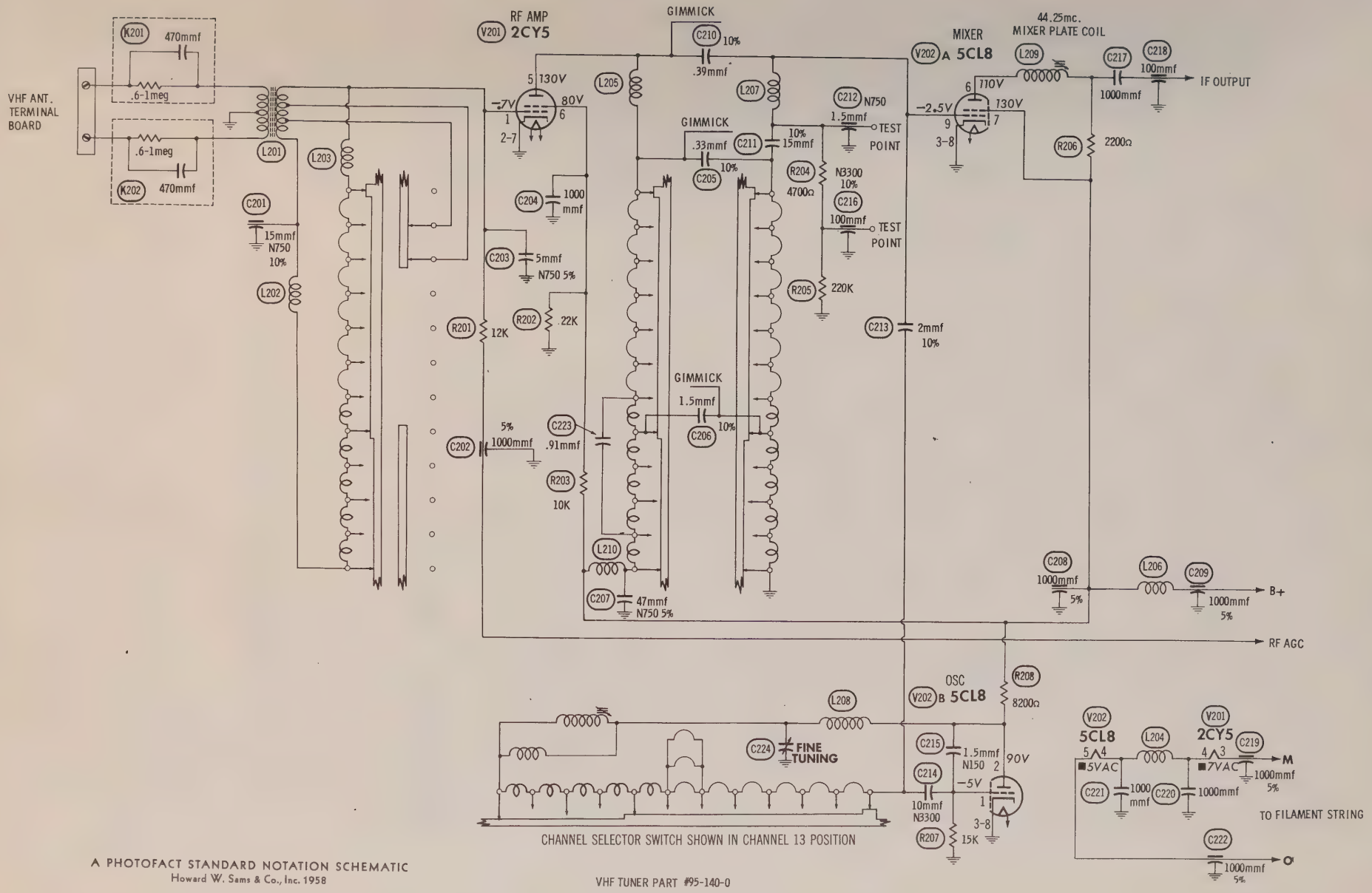


FIG. 1



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Howard W. Sams & Co., Inc. 1958

TUNER SCHEMATIC

SILVERTONE CHASSIS 528.51106, 107, 108, 160, 161, 163, 164, 165, 166, 167, 168, 170, 171, 172, 173, 175, 180, 181, 183, 184, 185, 187, 190, 191, 193, 194, 240, 241, 242, 245, 250, 251, 253

TUNER PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	2CY5	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	5CL8	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C201	15		258-150							N750 10%
C202	1000		244-1							5%
C203	5		225-509		TCN-5		TC7-5			N750 5%
C204	1000		2033-23	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C205	.33		2101-338							10%
C206	1.5		2101-159	NPO-SI 1.5	TCZ-1R5	C10V15C	TCO-1.5	ZT-5515	5TCCB-V15	10%
C207	47		233-470		TC7-47		TC7-47			N750 5%
C208	1000		244-1							5%
C209	1000		244-1							5%
C210	.39		2101-398							10%
C211	15		222-150	NPO-D115	DD-150	L10Q15	ED-15		5TCC-Q15	10%
C212	1.5		259-159							N750
C213	2		2101-209	NPO-SI 2.2	TCZ-2R2	C10V22C	TCO-2.2		5TCCB-V22	10%
C214	10		164-100							N3300
C215	1.5		170-159							N150
C216	100		252-101							N3300 10%
C217	1000		2033-23	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C218	100		253-101	EF-0001	MFT-100				503C-T1	
C219	1000		244-1							5%
C220	1000		2033-23	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C221	1000		2033-23	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C222	1000		244-1							5%
C223	.91									
C224			1713-511							

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	SILVERTONE PART No.	NOTES
R201	12K		106-123	
R202	22K		106-223	
R203	10K		106-103	
R204	4700Ω		106-472	

ITEM No.	RATING OHMS	RATING WATT	SILVERTONE PART No.	NOTES
R205	220K		111-224	
R206	2200Ω		106-222	
R207	15K		106-153	
R208	8200Ω		106-822	

COILS (RF-IF)

ITEM No.	USE	SILVERTONE PART No.	NOTES
L201	Ant. Trans.	2309-5	
L202	Ant. Coil	310-5	
L203	Ant. Coil	310-5	Channel 13
L204	Fil. Choke	300-20	
L205	RF Coil	313-7	Channel 13
L206	RF Choke	300-16	

ITEM No.	USE	SILVERTONE PART No.	NOTES
L207	Mixer Grid Coil	312-6	Channel 13
L208	Osc. Coil	300-4	Channel 13
L209	Mixer Plate Coil	2110-9	
L210	RF Choke	301-25	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SILVERTONE PART No.	REPLACEMENT DATA
K201	Antenna Isolation	470mmf, .6-1meg	330-1	
K202	Antenna Isolation	470mmf, .6-1meg	330-1	

TUNER ALIGNMENT INSTRUCTIONS

VHF OSCILLATOR ALIGNMENT

Turn the set on and allow a 15 minute warm-up period. Set the fine tuning to the center of its range. (This is accomplished by adjusting so that the hole in the fiber drive wheel is centered over channel 12 oscillator adjustment hole.) Leave the fine tuning in this position during all oscillator adjustments.

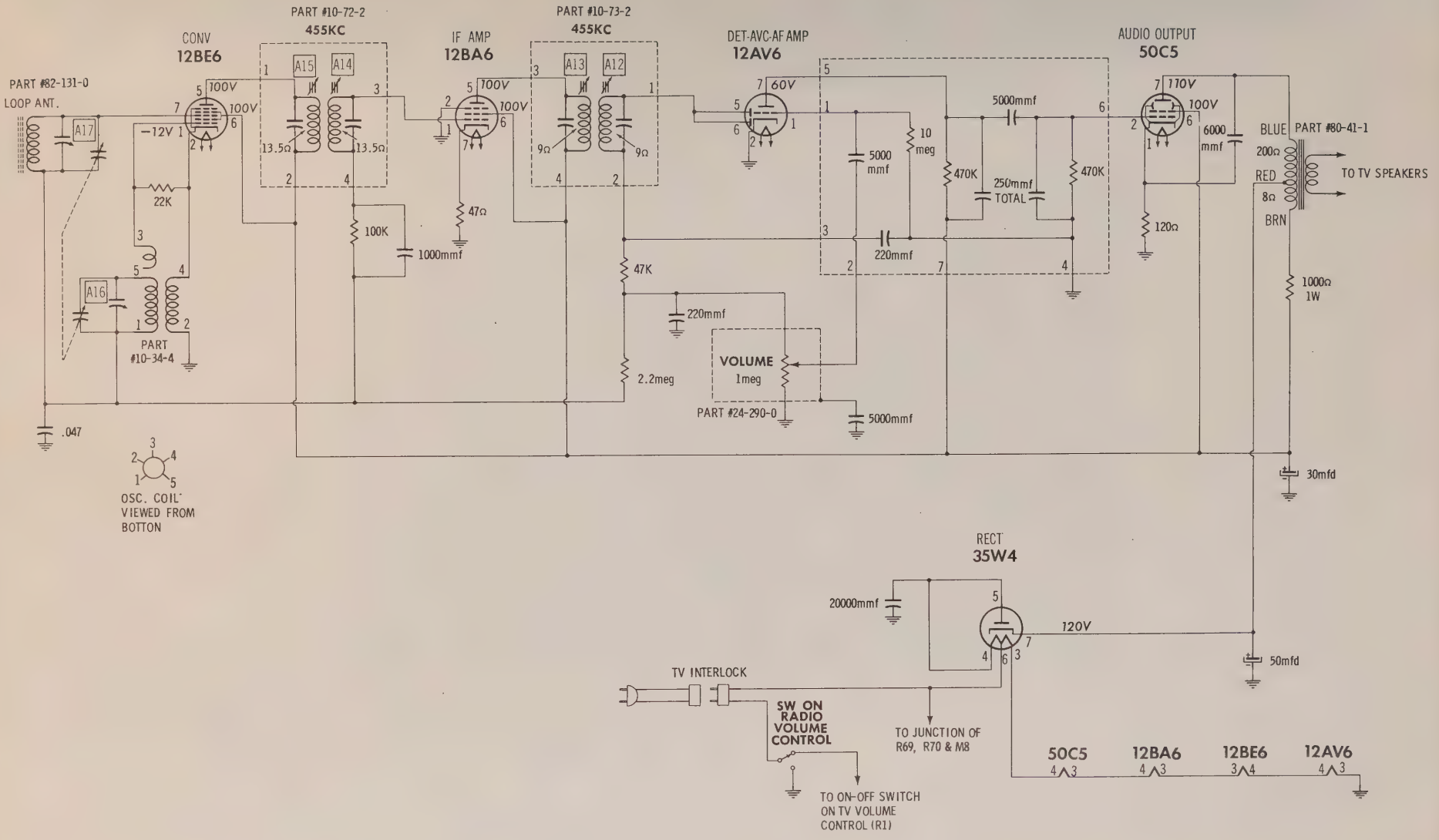
Turn the channel selector to the highest channel operating in your area. With a non-metallic screwdriver, adjust the proper oscillator adjustment screw for the clearest picture obtainable. The oscillator adjustment screws are identified by the channel number stamped into the metal next to the adjustment opening. Channels 7 and 8 use the same screw adjustment. All other channels have separate adjustment screws.

Be very careful not to turn any of the adjustment screws too far counter clockwise.

Always adjust highest operating channel first, continuing in descending order.

VHF RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.



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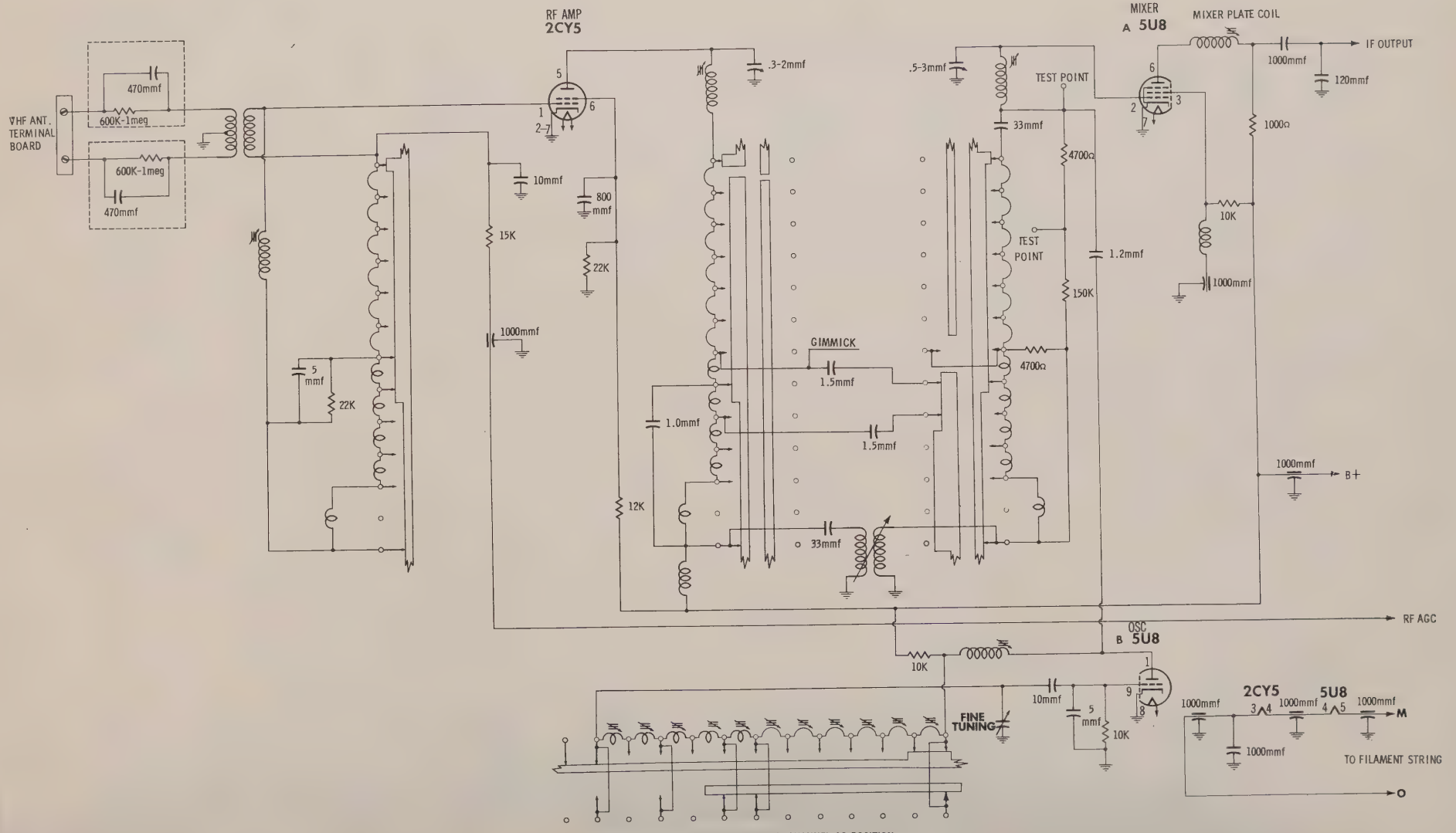
RADIO SCHEMATIC

SET 397 FOLDER 3

PAGE 7

FOLDER 3

SILVERTONE CHASSIS 528.51106, 107, 108, 160, 161, 163, 164, 165, 166, 167, 168, 170, 171, 172, 173, 175, 180, 181, 183, 184, 185, 187, 190, 191, 193, 194, 240, 241, 242, 245, 250, 251, 253

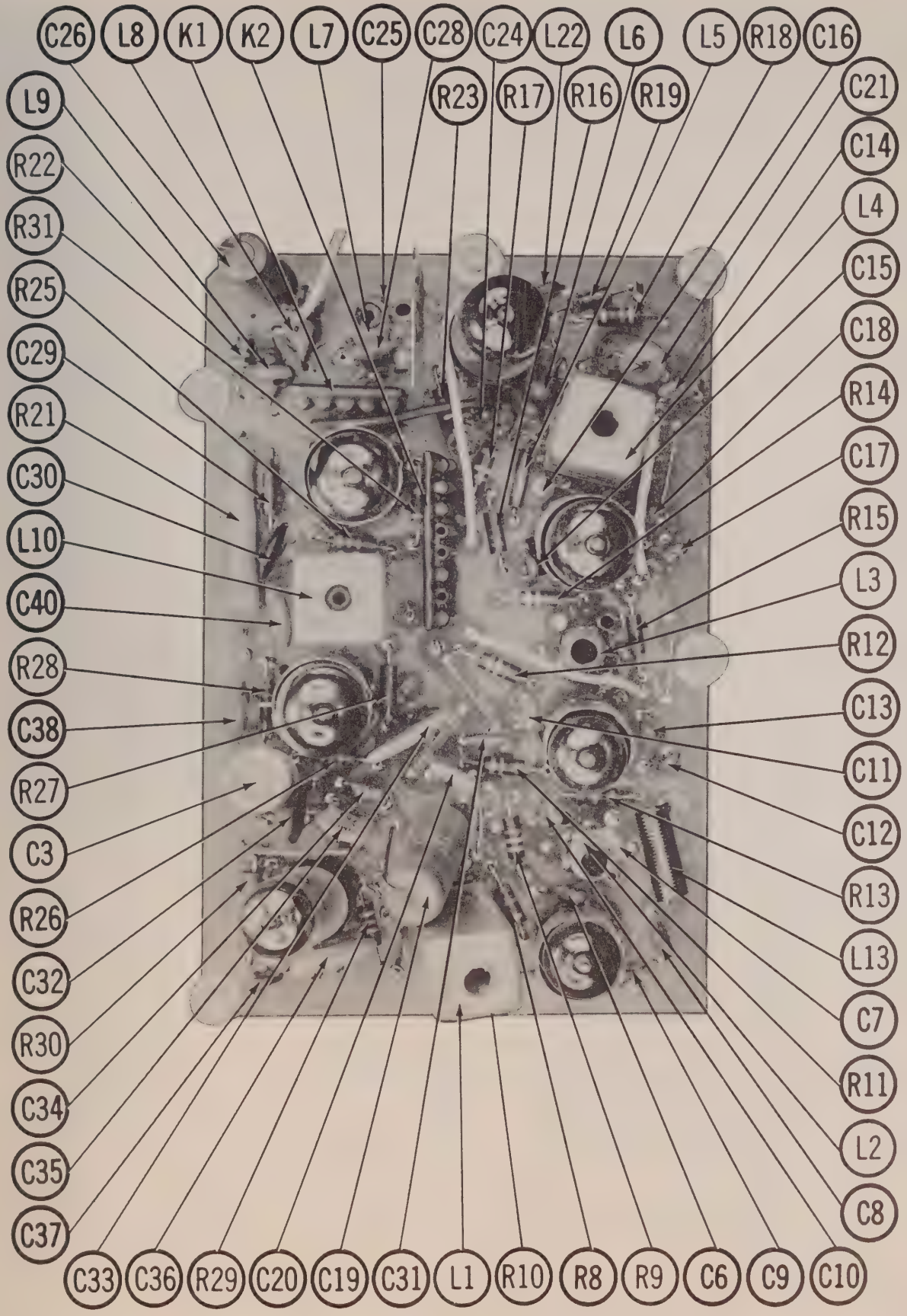


CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION

VHF TUNER PART #95-156-0

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

ALTERNATE VHF TUNER SCHEMATIC



VIDEO, SYNC & SOUND PRINTED BOARD

SET 397 FOLDER 3

SILVERTONE CHASSIS 528.51106, 107, 108, 160, 161, 163, 164, 165, 166, 167, 168, 170, 171, 172, 173, 175, 180, 181, 183, 184, 185, 187, 190, 191, 193, 194, 240, 241, 242, 245, 250, 251, 253

FOLDER 3

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	1st Video IF Amp	3HZ8	
V2	2nd Video IF Amp	3HZ8	
V3	3rd Video IF Amp - Video Det	5AM8	
V4	Video Output-Sync Sep	6BH8	
V5	Sound IF Amp -Sync Amp	5L8	
V6	Raster Det -AF Amp	6BN8	
V7	Audio Output	5AQ8	
V8	Vert Mult -Vert Output	6CM7	
V9	Horiz. AFC-Horiz Osc.	6GG7	
V10	Horiz Output	1LA9GA	
V11	Damper	1AX4GTA	
V12	HV Rectifier	1B3GT	

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	SILVERTONE PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	
V13	24AEP4		24AEP4 ①	24AEP4 ②	① Silverama ®
	21CBP4		21CBP4 ①	21CBP4	② Silver Screen 85°
				21CBP6A ②	

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA					
	CAP	VOLT	SILVERTONE PART No	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No	PYRAMID PART No	SANGAMO PART No
C1A	120	150	18-50-5	PR2-050	CBR5015	TC395		MT-15150
B	120	150			CBR5015	TC495		MT-13150
C2A	40	300	18-23-2	PR5-500		TC496		Q-086
B	20	300				WV404		MT-0550
C	20	300						
D	20	300						
E	50	50						
C3	4	50	18-25-0	PRS150V4	BBR4-50	TC30	TD-4-50	MT-0504
C4	50	25	18-23-0 ①	PRS25V50	BBR50-25	TC29	TD-50-25	MT-0250
C5	20	300	18-57-5 ②	NP-PRS300V	BR4035	TC78	TD-40-350	MT-4545
				20	BR4035	TC78	TD-40-350	MT-4540

ITEM No	REPLACEMENT DATA		NOTES
	MALLORY PART No	SPRAGUE PART No	
C3A	MT-15150	*PR2505	
B	MT-13150		
C2A	Q-086	*PR2325	
B	MT-0550		
C			
D			
E			
C3	MT-0504	TVA-1402	
C4	MT-0250	TVA-1206	
C5	MT-4545	*PR2449	
	MT-4540		

① Chassis 528 S1240 241, 242, 245, 250, 251, 253 use 25mfd @ 15V (Part #18-56-5) in this application
② Special unit
* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING		REPLACEMENT DATA							NOTES
	CAP	VOLT	SILVERTONE PART No	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No	SPRAGUE PART No.	
C6	470		20-66-0		DS-471	SRS747	ED-470		MS-347	10%
C7	27				DTS-27	CDS27C	TCO-27			NPO 10%
C8	1000		18-10217	BPD-001	DD-102	BYAS21	ED-1000	DCS21	5HK-D1	
C9	1000		18-10217	BPD-001	DD-102	BYAS21	ED-1000	DCS21	5HK-D1	
C10	1000		18-10217	BPD-001	DD-102	BYAS21	ED-1000	DCS21	5HK-D1	①
C11	680		18-5811		DR-681	IRS768	ED-680		MS-368	10%
C12	1000		18-10217	BPD-001	DD-102	BYAS21	ED-1000	DCS21	5HK-D1	
C13	1000		18-10217	BPD-001	DD-102	BYAS21	ED-1000	DCS21	5HK-D1	
C14	940		18-50217		DR-941	IRS794	ED-940		MS-358	10% ②
C15	1000		18-10217	BPD-001	DD-102	BYAS21	ED-1000	DCS21	5HK-D1	
C16	10		30-14-0		SI 10	DS-100	GP-10	UC-541	5GA-Q1	
C17	1000		18-10217	BPD-001	DD-102	BYAS21	ED-1000	DCS21	5HK-D1	
C18	1000		18-10217	BPD-001	DD-102	BYAS21	ED-1000	DCS21	5HK-D1	
C19	.33	300	18-32428			CUBZP33		GEM-3022	2TM-P33	
C20	5000		18-50217		BPD-502	BYAI05	ED-005	DCS25	5HK-D5	③
C21	.047	300	18-47328		P288N-047	DF-S03		GEM-4147	4TM-S47	
C22	1000		18-10217		BPD-001	DD-102	BYAS21	ED-1000	DCS21	5HK-D1
C23	1000		18-10217		BPD-001	DD-102	BYAS21	ED-1000	DCS21	5HK-D1
C24	1000		18-10217		BPD-001	DD-102	BYAS21	ED-1000	DCS21	5HK-D1 ④
C25	33				BPD-000033	DD-330	BYAS21	ED-33	UC-5433	5GA-Q33
C26	.047	600	16-47348		P488N-047	DF-S03		CUB4547	GEM-4147	4TM-S47
C27	10000		18-10217		BPD-01	DD-103	BYAS21	ED-01	DC51	5HK-01
C28	33				BPD-000033	DD-330	BYAS21	ED-33	UC-5433	5GA-Q33
C29	5000		18-50217		BPD-005	DD-502	BYAI05	ED-005	DCS25	5HK-D5
C30	5000		18-50217		BPD-005	DD-502	BYAI05	ED-005	DCS25	5HK-D5
C31	5000		18-50217		BPD-005	DD-502	BYAI05	ED-005	DCS25	5HK-D5 ③
C32	5000		18-50217		BPD-005	DD-502	BYAI05	ED-005	DCS25	5HK-D5 ③
C33	20000		18-20217		BPD-02	BYBS02	ED-02			5HK-S2
C34	1000		18-10211			IR5H	ED-1000	MCB25S	MS-21	10%
C35	5000		18-50217		BPD-005	DD-502	BYAI05	ED-005	DCS25	5HK-D5
C36	5000	3000	18-79-0			DKB0-502	BYC20D5			20KVB-D5
C37	1000		18-10217		BPD-001	DD-102	BYAS21	ED-1000	DCS1	5HK-D1
C38	10000		18-10217		BPD-01	DD-103	BYAS81	ED-01	DC51	5HK-01
C39	4700				BPD-0047	DD-472	BYAI04D7	ED-0047	UC-5247	5HK-D47 ③
C40	10000		18-10217		BPD-01	DD-103	BYAS81	ED-01	DC51	5HK-01
C41	.0068	600	16-58267						GEM-16388	10%
C42	.0068	1000	16-58267						GEM-16388	10% ③
C43	.1	400	18-10446		P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1
C44	.047	600	20-54-1		P488N-047	DF-S03	CUB4547		GEM-4147	4TM-S47
C45	.22	200	16-32428		P288N-33		CUB2P22		GEM-3022	2TM-P22
C46	270		20-107-0							N750 10%
C47	.01	600	20-18-1							
C48	1000		20-9-2		1464-001		IR5H		MCE25S	MS-21	5%
C49	.047	400	16-47347						GEM-1615	10%
C50	130	4000	15-13146							N1500 10% ③
C51	10000		18-10217	BPD-01	DD-103	BYAS81	ED-01	DC51	5HK-01	
C52	68	3000								5% ③
C53	1000		18-10217	BPD-001	DD-102	BYAS21	ED-1000	DCS1	5HK-D1	
C54	.047	600	20-547-1							
C55	.047	600	20-547-1							
C56	.022	500	18-23358		P688N-022	DD-223	CUB6S22	ED-01	GEM-5122	6TM-S22
C57	.047	600	20-547-1							

① Not used in Chassis 528.S1108, 107, 108, 160, 161, 163, 164, 165, 166, 167, 168, 170, 172 use part #18-50217 in this application.
② Chassis 528.S1106, 107, 108, 175, 187, 194, 245, 253 use 5000mmf (Part #15-50217) in this application.
③ Not used in Chassis 528.S1106, 107, 108, 175, 187, 194, 245, 253.
④ Not used in Chassis 528.S1106, 107, 108, 194, 195, 196, 197, 198, 173, 184, 185, 187, 193, 194, 242, 245, 250, 253.
⑤ Chassis 528.S1160, 240 may use 1000mmf (Part #15-10217) in this application.
⑥ Not used in Chassis 528.S1160, 170, 180, 181, 190, 240, 250.
⑦ Chassis 528.S1168 uses .01mfd @ 1000V 10% (Part #20-76-1) in this application.
⑧ Nominal value. Replace with original value used in this application.
* Not used in some versions

CONTROLS

ITEM No	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST ANCE	WATTS	SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No	MALLORY PART No	
R1A	500K		24-235-0	B-60	A47-500K-Z	QI3-133	TA35A	Volume - Note 1
B	Shaft			Not Reg	KS8-3	Not Reg	Not Reg.	
C	Switch			KB-1 or KR-1*	SWF-12	76-1	US-26	
R2A	500K		24-78-1	B-4	A47-500-S	QH-103	TA52L	Contrast
B	shaft			Not Reg	KS8-3	Not Reg.	Not Reg.	
R3A	1 Meg		24-264-1	B-58	A47-4meg-S			Brightness
B	Shaft			Not Reg.	Not Reg.			
R4A	1 Meg		24-79-1	B-68 †	A47-1meg-S †	QH-137 †	TA35L †	Vert. Hold with 500K stop- Note 2
B	Shaft			Not Reg	KS8-3	Not Reg	Not Reg.	Height with 330K stop
R5	5meg		24-268-1					Vert Lin
R6	5000Ω		24-267-1					Local-Dist. with 1.2meg stop
R7A	5meg		24-91-1	AB-86 ●	A47-4meg-Se	QH-141 ●	PTA55L ●	
B	Shaft			AK-19	RN-3	TQ	Not Reg.	

Note 1. A 500K control without switch (Part #24-236-0) used in Chassis 528.S1173, 175, 180, 181, 183, 184, 185, 187, 190, 191, 193, 194.
Note 2. A 1meg control without stop (Part #24-113-1) used in Chassis 528.S1164.
† Use a 500K resistor in series with right hand terminal.
● Use a 1 meg resistor in series with right hand terminal.
* Use KR with CRL "red label" controls and KB with "blue label" controls.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING		SILVERTONE PART No	NOTES
	OHMS	WATT		
R8	5600Ω		80-56401	
R9	330Ω		80-33102	
R10	56Ω		80-56901	
R11	15K		80-15301	
R12	330Ω		80-33102	
R13	56Ω		80-56901	
R14	56K		80-56301	Note 1
R15	1000Ω		80-10202	
R16	220Ω		80-22101	
R17	560K		80-56401	
R18	4700Ω		80-47202	
R19	1meg		80-10503	Note 2
R20	39Ω		80-39002	
R21	4700Ω	4	61-5-1	Note 3
R22	180K		80-18401	
R23	18meg		80-18903	
R24	68K		80-10401	
R25	2200Ω		80-22202	
R26	18K		80-18301	
R27	2.2meg		80-22503	
R28	220K		80-22403	
R29	470K		80-47402	
R30	270Ω	1	80-27101	
R31	820Ω		80-82201	

ITEM No	RATING		SILVERTONE PART No	NOTES
	OHMS	WATT		
R32	470K		80-47401	Note 4
R33	150K	1	80-15411	Note 5
R34	2.2meg		80-22502	
R35	1000Ω		80-10202	
R36	4700		80-47202	Note 4
R37	560Ω		80-56101	Note 6
R38	560Ω		80-56101	Note 6
R39	180K 5%	1		Note 7
R40	8300Ω		80-82301	
R41	270K		80-27401	
R42	8800Ω	2	80-88211	
R43	33Ω			Note 8
R44	2.7Ω		80-27901	Note 8
R45	1000Ω		80-10201	
R46	4700Ω		80-47202	
R47	1500Ω	2	80-15223	Note 9
R48	1200Ω	15	61-123-0	
R49	470Ω	1	80-47102	
R50	4.5Ω	10	61-115	
R51	780Ω	10	61-119	
R52	33Ω	25	61-118	
R53	200Ω 5%	15	61-41	
R54	2.2meg		80-22502	Note 10
R55	4.7meg		80-47502	Note 10

Note 1. Chassis 528.S1160 uses 27K (Part #80-27301). Chassis 528.S1108, 107, 108, 175, 187, 194, 245, 253 use 8200Ω (Part #80-82201) in this application.
Note 2. Chassis 528.S1164, 165, 166, 167, 168, 172, 173, 184, 185, 193, 194, 242, 250 use 4.7meg (Part #80-47502) in this application.
Note 3. Chassis 528.S1164, 165, 166, 167, 168, 172, 173, 184, 185, 193, 242, 250 use 3900Ω 4W (Part #61-9-1) in this application.
Note 4. Not used in Chassis 528.S1164.
Note 5. Chassis 528.S1164 uses 100K (Part #80-10401) in this application.
Note 6. Nominal value. Use original value when replacing.
Note 7. Chassis 528.S1160, 170, 181, 193, 240 use 150K (Part #80-15411) in this application.
Note 8. Chassis 528.S1163, 164, 165, 166, 170, 171, 172, 173, 180, 181, 183, 184 use 2.2Ω (Part #80-22901) in this application.
Note 9. Chassis 528.S1181, 181 use 5800 1W (Part #80-58111) in this application.
Note 10. Not used in Chassis 528.S1160, 165, 166, 167, 168, 170, 172, 173, 180, 181, 184, 185, 190, 193.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							NOTES
		SILVERTONE PART No.	Hallodrson PART No.	Merit PART No.	Ram PART No.	Stancor PART No	Thordarson PART No	Triad PART No	
T1	Vert. Output	B80-1-2F	Z1807	A-2824	V315	VO-101	25S76	A-11GX	
	Alt. Vert. Output	B0-1-2							
T2A	Yoke-Horiz. (20MH)	D80-2-4J	DF607	MDF-92	Y90F19/43	DY-15A	Y-16	Y-41 &	
B	(90°) Yoke (60MH)	2	4		5	5	4	NW3	
	Alternate Yoke	80-2-4							
	Alternate Yoke	80-1-4							
M7	Rear Cover & Centering Device	83-936							Alternate
		83-1034							
	Yoke Clamp	22-2-3							
T3	Horiz. Output	C80-1-3H							
	Alt. Horiz. Output	80-1-3							

① Cut and tape blanking lead.
② Drill new mounting hole(s).
③ Includes yoke plug, rear cover and centering device.
④ Upper yoke terminal #1 and #6;connect to pin #6 yoke plug. Connect yoke terminal #3 to yoke plug pin #7, yoke terminal #4 to yoke plug pin #3. Use original rear cover and centering device, and width sleeve.
⑤ Use original damping network, if necessary.
⑥ Used in Chassis 528.S1160, 161, 162, 163, 170, 180, 181, 182, 183, 190, 242.

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	SILVERTONE PART No.	Hallodrson PART No.	Merit PART No.	Ram PART No.	Stancor PART No	Thordarson PART No.	Triad PART No	
T4	6400Ω	3-4Ω	80-21-1	21110	A-3026		A-3877	44S48	S-6X	

① Chassis 528.S1108, 107, 108, 160, 161, 163, 163, 164, 165, 166, 167, 168, 170, 172 use part #82-21-1 in this application.
② Drill new mounting hole.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP	SILVERTONE PART No.	QUAM PART No.	
SP1	5"	PM	8-8Ω	33-301-4 ①	5A07BZ7.5	① Used in Models S154, S155, S164, S166, S185, S196, S197, S198, S199
SP4	5"	PM	8-8Ω	33-301-4 ①	5A07BZ7.5	
6"x9"	PM		8-8Ω	33-317-4 ②		② Used in Models S184, S186, S188

COILS (RF-IF)

ITEM No	USE	REPLACEMENT DATA					NOTES
		SILVERTONE PART No.	Meissner PART No	Merit PART No	Miller PART No.	Ram PART No.	
L1	1st. Video IF	10-82-2					Includes 41.25MC Trap
L2	2nd. Video IF	10-16-3					Includes 47.25MC Trap
L3	3rd. Video IF	10-17-3					
L4	4th. Video IF	10-83-4					
L5	Resonant Choke	10-68-1					12 Microhenries
L6	Series Peaking Coil	10-13-1	19-3125	TV-196	6153	VP-4	120 Microhenries
L7A	4.5MC Trap	10-129-1					
B	Sound IF						
L8	Series Peaking Coil	10-122-1	19-3180 *	TV-184 *	6180 *	VP-5 *	180 Microhenries, wound on 10K resistor
L9	Shunt Peaking Coil	10-86-1	19-3250	TV-196	6130	VP-6	250 Microhenries
L10	Ratio Det.	10-21-0					
L11	RF Choke	10-138-1	19-1002	SW-530	4606		2.6 Microhenries
L12	RF Choke	10-138-1	19-3250	TV-196	6130	VP-6	270 Microhenries
L13	RF Choke	10-122-1	19-1002	RC-563	4606		2.3 Microhenries

* Parallel with 10K resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA					NOTES
	PRI.	SEC.	SILVERTONE PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	
L14	570 *		10-13-5 ①						Horiz. Waveform Coil - 440

* Tapped @ 55Ω.
① Chassis 528.S1193, 194 use part #10-143-1. Chassis 528.S1164 uses part #10-121-1.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SILVERTONE PART No	REPLACEMENT DATA
K1	Sync-Sound Circuit	560mmf 10%, 5000mmf, 8000mmf, 22K, 220Ω, 3300Ω, 470K, 270Ω	13-15-5	
K2	Sync Circuit	5000mmf, 150mmf 10% N1500, 22K, 270K, 2.2meg	13-9-5	
K3	Vert. Circuit	10000mmf, 10000mmf, 8000mmf, 5000mmf, 5000mmf, 47K, 15K, 33K, 47K, 22K, 68K	13-12-5 ①	
K4	Horiz. Circuit	5600mmf, 270mmf 10%, 8000mmf, 8000mmf, 220mmf 10%, 47mmf 10%, 470K, 18K, 15K, 330K, 100K, 470K, 330K, 8200Ω	13-11-5	
K5	Cabinet Mtg. Bkt Insl.	1000mmf, 1000VAC, 4.7meg	13-17-3	

① In chassis 528.S1164 2000mmf, 9000mmf, 9000mmf, 9000mmf, 56K, 12K, 33K, 56K, 22K, 22K (Part #13-20-3) is used in this application.

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	SILVERTONE PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	GENERAL ELECTRIC PART No.	SARKES TARZIAN PART No.	
M1	.260A	83-829	1090A	1N1007	MR300	300	① Selenium type.
						M600 ②	② Germanium type.
M2	.260A	83-829	1090A	1N1007	MR300	300 ①	③ Silicon type.
						M600 ②	

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M3	Lamp	88-21	#47
M4	Tuner	96-140-0	VHF, Ch. 528.S1108, 160, 161, 163, 164, 165, 166, 160, 181, 182, 183, 184, 185, 187, 240, 241, 242, 245
	Tuner	96-186-0	VHF Ch. 528.S1107, 168
	Tuner	96-154-0	VHF Ch. 528.S1168, 167
	Tuner	96-146-0	UHF-VHF Ch. 528.S1170, 171, 172, 173, 175, 190, 181, 182, 183, 184, 250, 251, 253
	Tuner	96-135-0	UHF Ch. 528.S1170, 171, 172, 173, 175, 190, 181, 182, 183, 184, 250, 251, 253
M5	Switch	69-209-0	Phono-TV (Rotary wafer type) Ch. 528.S1106, 107, 108, 165, 166, 167, 168, 172, 173, 175, 184, 185, 187
M6	Width Device	83-1052	
M7	Centering Device	83-936	Include yoke rear cover
	Centering Device	83-1034*	* Alternate. Includes yoke rear cover
M8	Circuit Breaker	43-1-1	Ch. 528.S1160, 161, 162, 163, 164, 165, 170, 171, 172, 180, 181, 182, 183, 184, 190, 191, 192, 240, 241, 250
	Circuit Breaker	43-3-3	Ch. 528.S1106, 107, 108, 166, 167, 168, 173, 175, 185, 187, 193, 194, 242, 245, 251, 253
	Magnet	27-86-3	Beam Alignment - Used with some picture tubes
	Printed Board	84-4032	Vert., Horiz. Osc. Assy. - Less tubes
	Printed Board	84-4365	IF, Sync, Sound Assy. - Less tubes

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	48-141-0	Models S196, S197, S198, S199
Safety Glass	48-138-0	Models S154, S155
Safety Glass	48-142-0	Models S184, S186, S188
Mask	40-8-4	Models S185, S197, S198, S199
Mask	40-4-4	Models S154, S155
Mask	40-8-4	Models S164, S166, S188
Knob	53-880-0	Auxiliary Controls
Knob	52-904-0	Channel Selector - Mod. # S154, S196, S198
Knob	52-914-0	Channel Selector - Models S164, S186, S188
Knob	52-880-0	VHF Channel Selector - Models S155, S197, S199
Knob	52-927-0	UHF Channel Selector - Models S155, S197, S199

SILVERTONE CHASSIS 528.S1106, 107, 108, 160, 161, 163, 164, 165, 166, 167, 168, 170, 171, 172, 173, 175, 180, 181, 183, 184, 185, 187, 190, 191, 193, 194, 240, 241, 242, 245, 250, 251, 253.

FOLDER 3

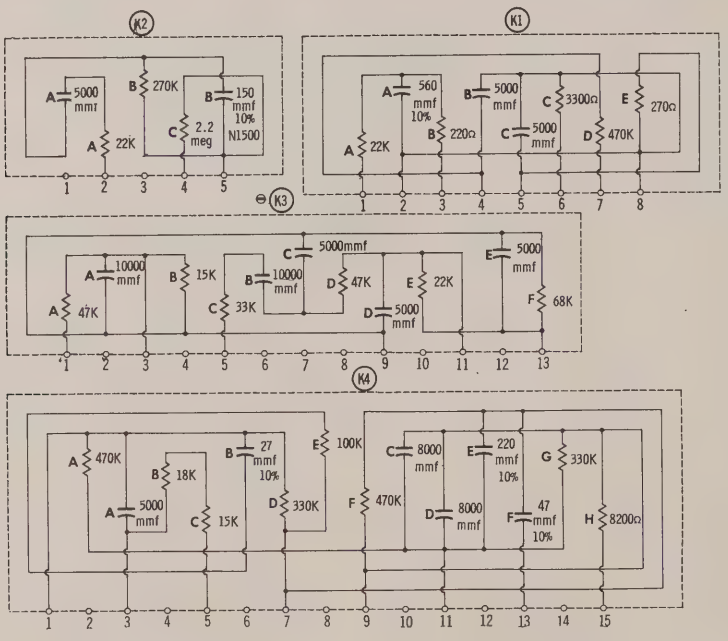
PARTS LIST AND DESCRIPTIONS (Continued)

CABINETS & CABINET PARTS (cont)

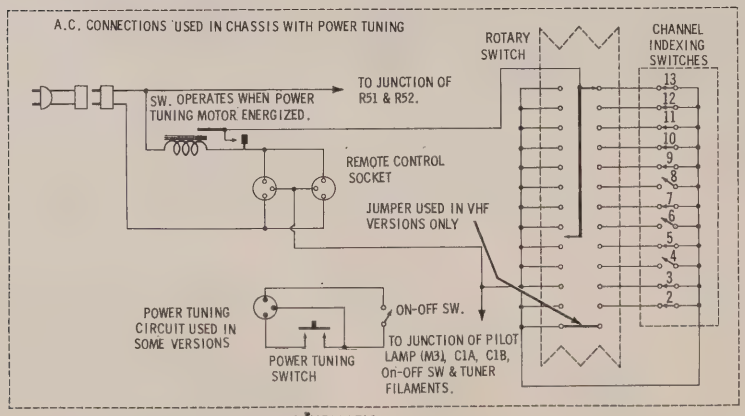
NAME	PART NO.	DESCRIPTION
UHF Dial	52-925-0	Models 8155, 8197, 8199
Pushbutton	52-911-0	On-Off - Models 8184, 8186, 8188
Pushbutton	52-912-0	Power Tuning - Models 8184, 8186, 8188
Leg	49-254	Models 8196, 8197
Leg	49-255	Models 8198, 8199
Leg	49-184	Model 8154
Leg	49-195	Model 8184
Leg	49-196	Model 8186
Leg	49-206	Model 8188
Cabinet	42-51-0	Model 8196
Cabinet	42-52-0	Model 8197
Cabinet	42-53-0	Model 8198
Cabinet	42-54-0	Model 8199
Cabinet	42-23-0	Model 8154
Cabinet	42-34-0	Model 8184
Cabinet	42-35-0	Model 8186
Cabinet	42-40-0	Model 8188

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor



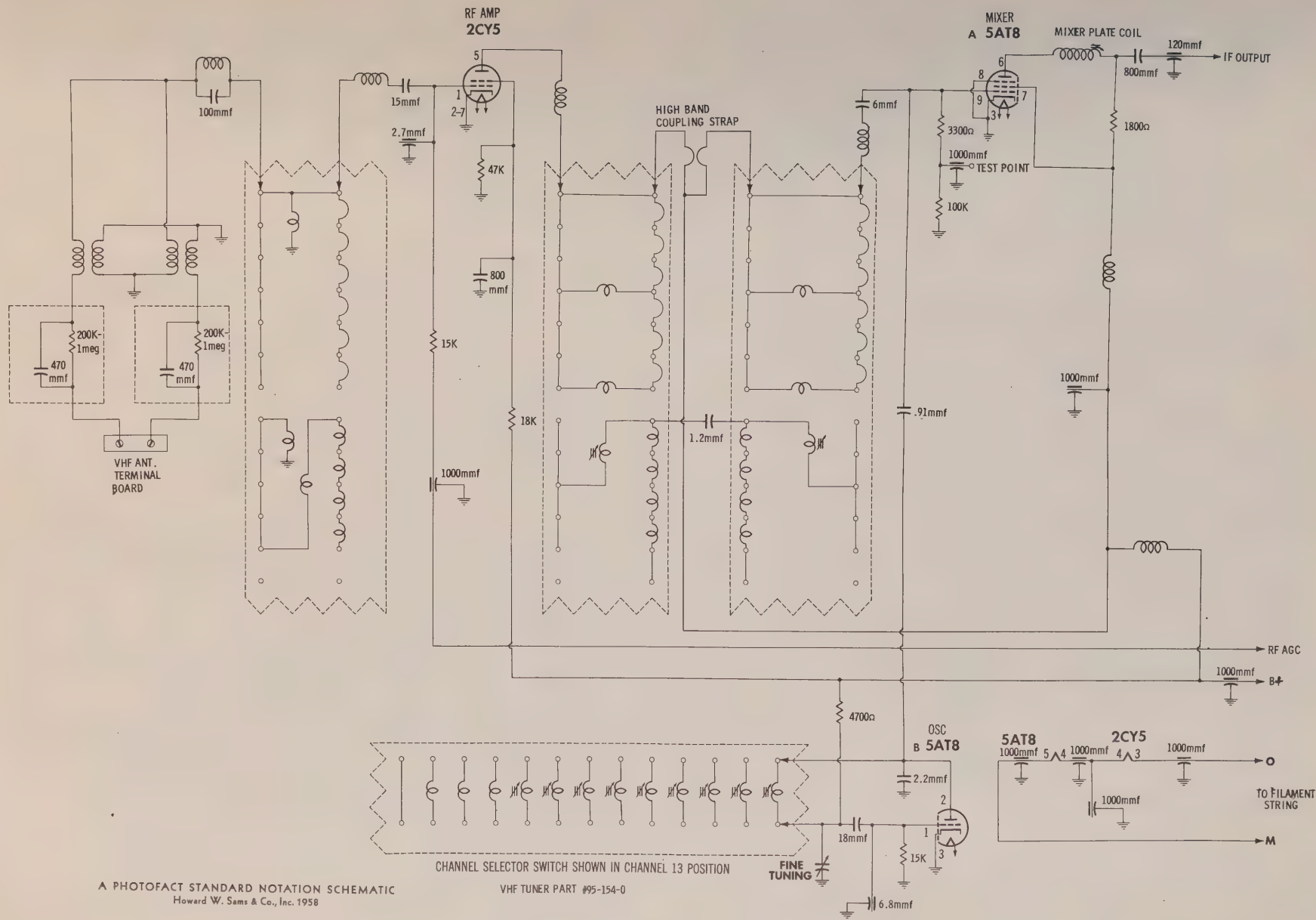
COMPONENT COMBINATION LAYOUT


A.C. CONNECTIONS USED IN CHASSIS WITH POWER TUNING
ROTARY SWITCH
CHANNEL INDEXING SWITCHES
TO JUNCTION OF R51 & R52.
SW. OPERATES WHEN POWER TUNING MOTOR ENERGIZED.
REMOTE CONTROL SOCKET
JUMPER USED IN VHF VERSIONS ONLY
ON-OFF SW.
POWER TUNING CIRCUIT USED IN SOME VERSIONS
POWER TUNING SWITCH
TO JUNCTION OF PILOT LAMP (M3), C1A, C1B, On-OFF SW & TUNER FILAMENTS.
13 12 11 10 9 8 7 6 5 4 3 2

A PHOTOFACT STANDARD NOTATION SCHEMATIC

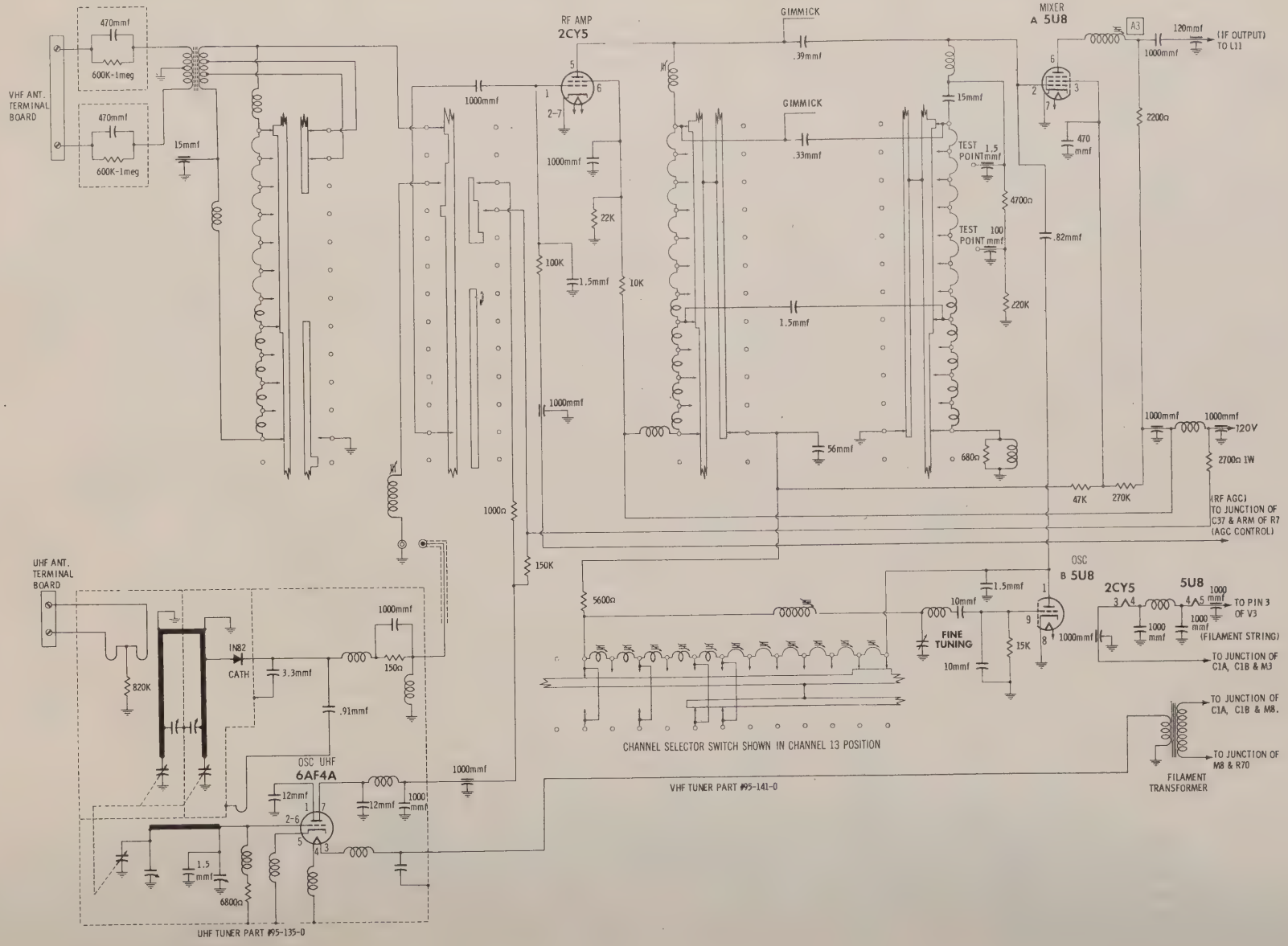
Howard W. Sams & Co., Inc. 1958

REMOTE TUNING UNIT



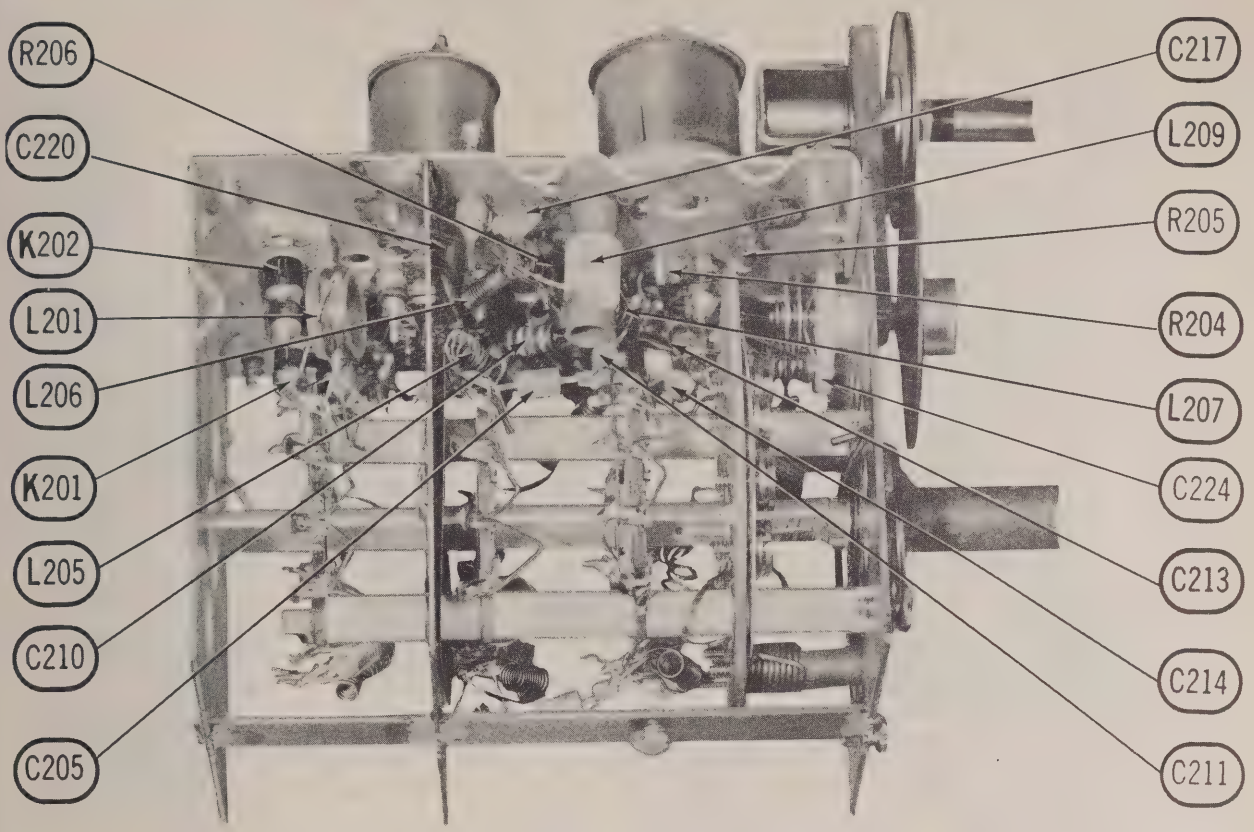
ALTERNATE VHF TUNER SCHEMATIC

SILVERTONE CHASSIS 528.51106, 107, 108, 160, 161, 163, 164, 165, 166, 167, 168, 170, 171, 172, 173, 175, 180, 181, 183, 184, 185, 187, 190, 191, 193, 194, 240, 241, 242, 245, 250, 251, 253

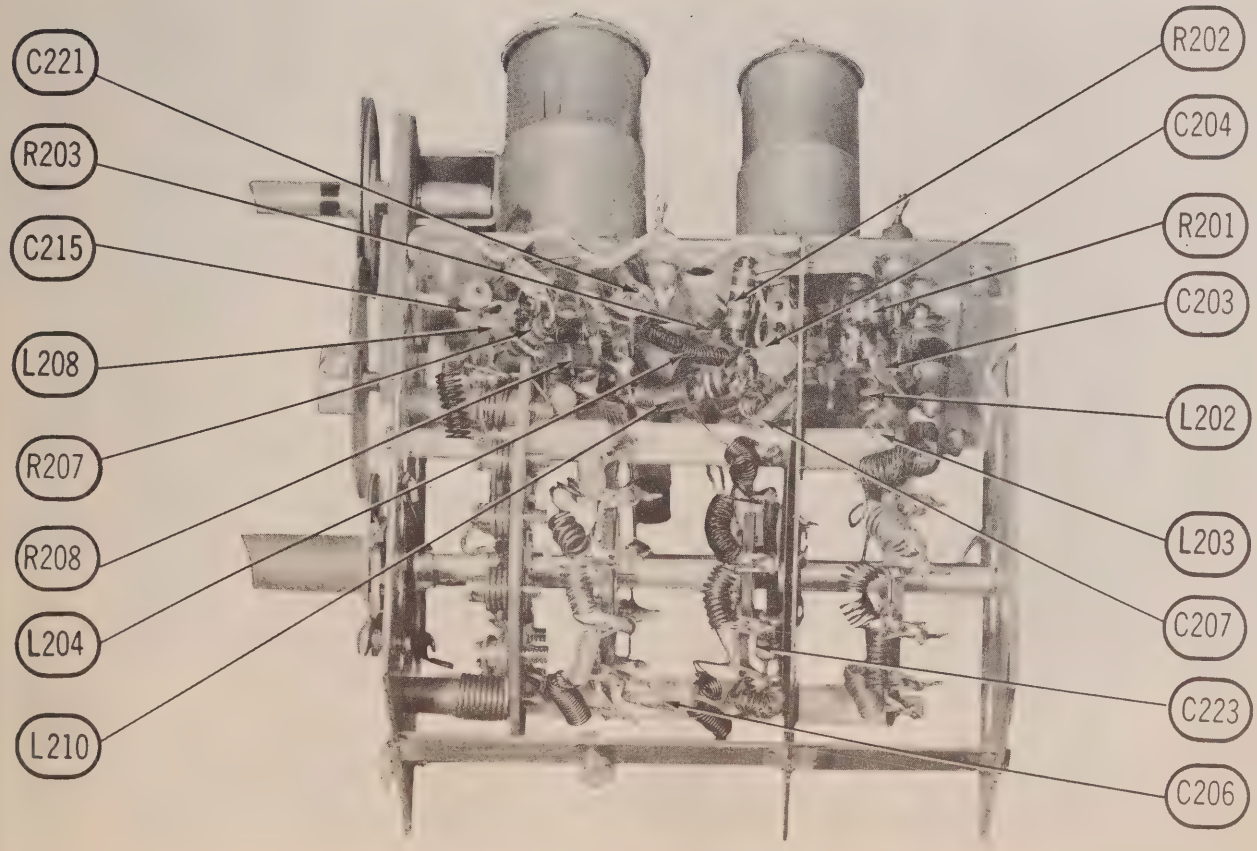


A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

ALTERNATE UHF-VHF TUNER SCHEMATIC



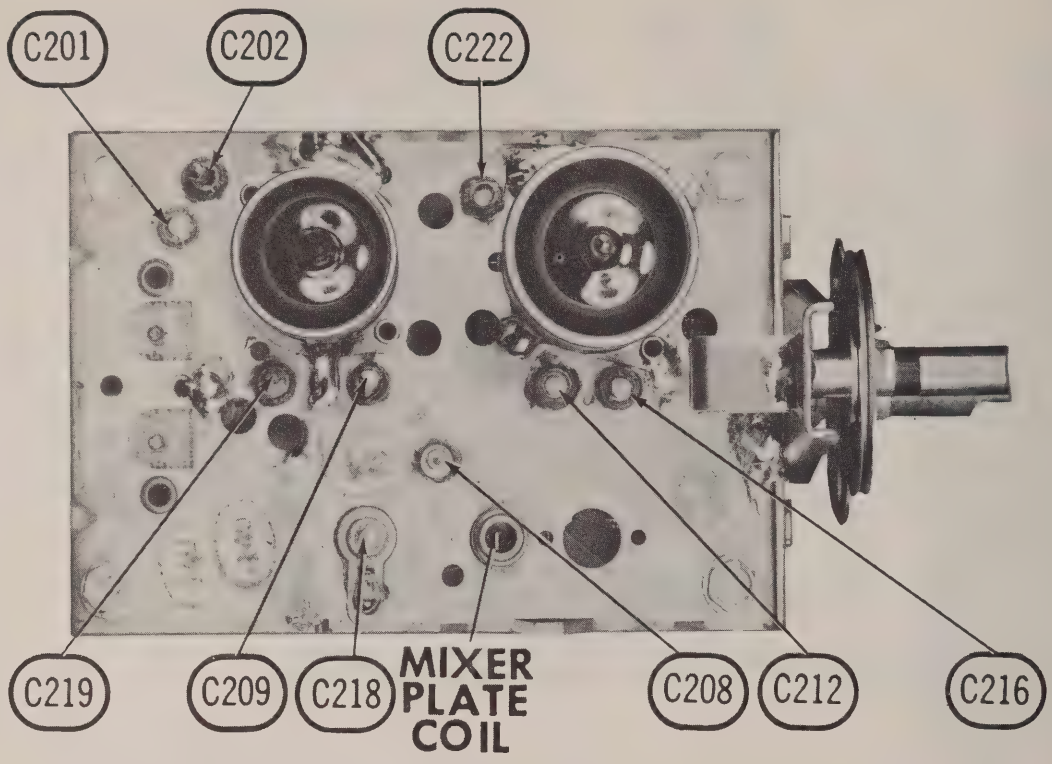
TUNER-LEFT SIDE



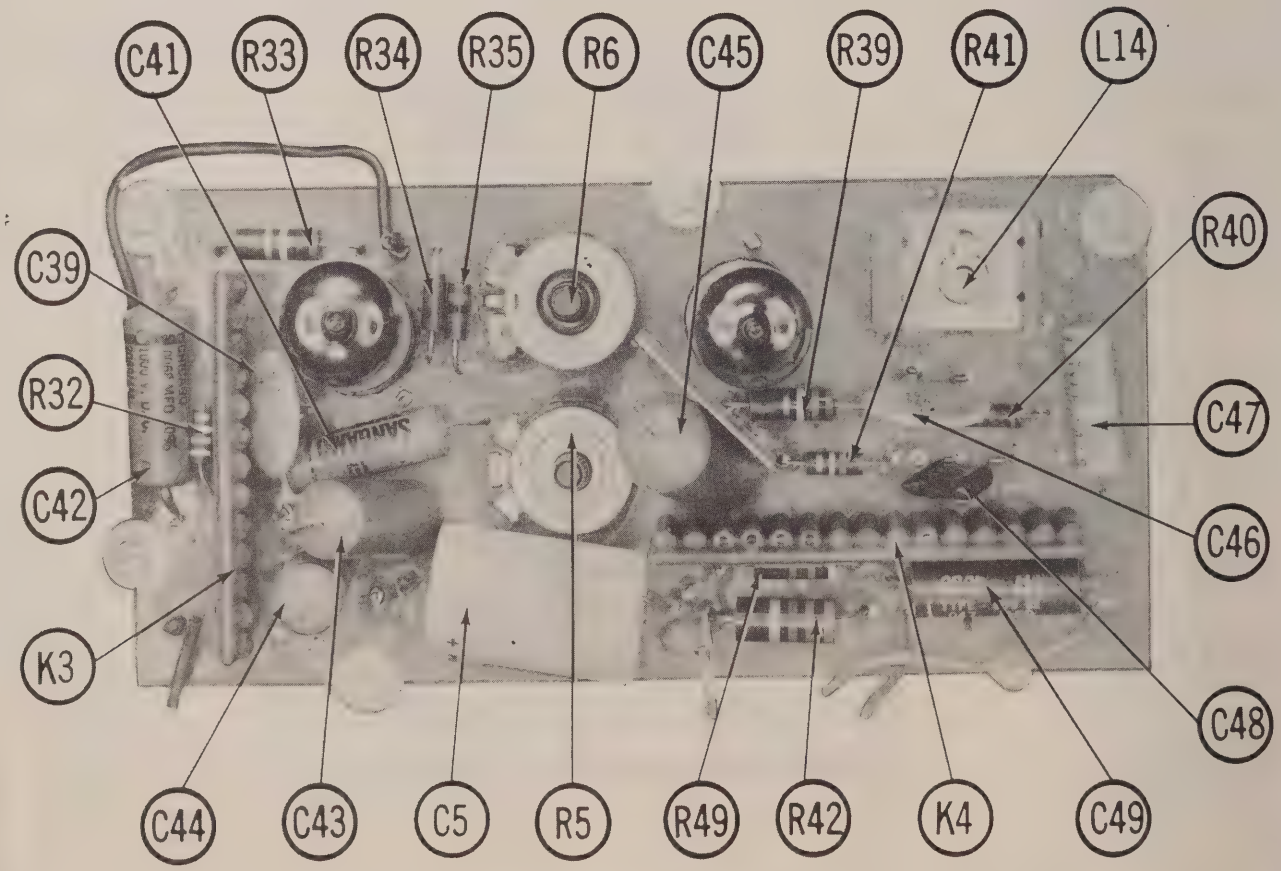
TUNER-RIGHT SIDE

SILVERTONE CHASSIS 528.51106, 107, 108, 160, 161, 163, 164, 165, 166, 167, 168, 170, 171, 172, 173, 175, 180, 181, 183, 184, 185, 187, 190, 191, 193, 194, 240, 241, 242, 245, 250, 251, 253

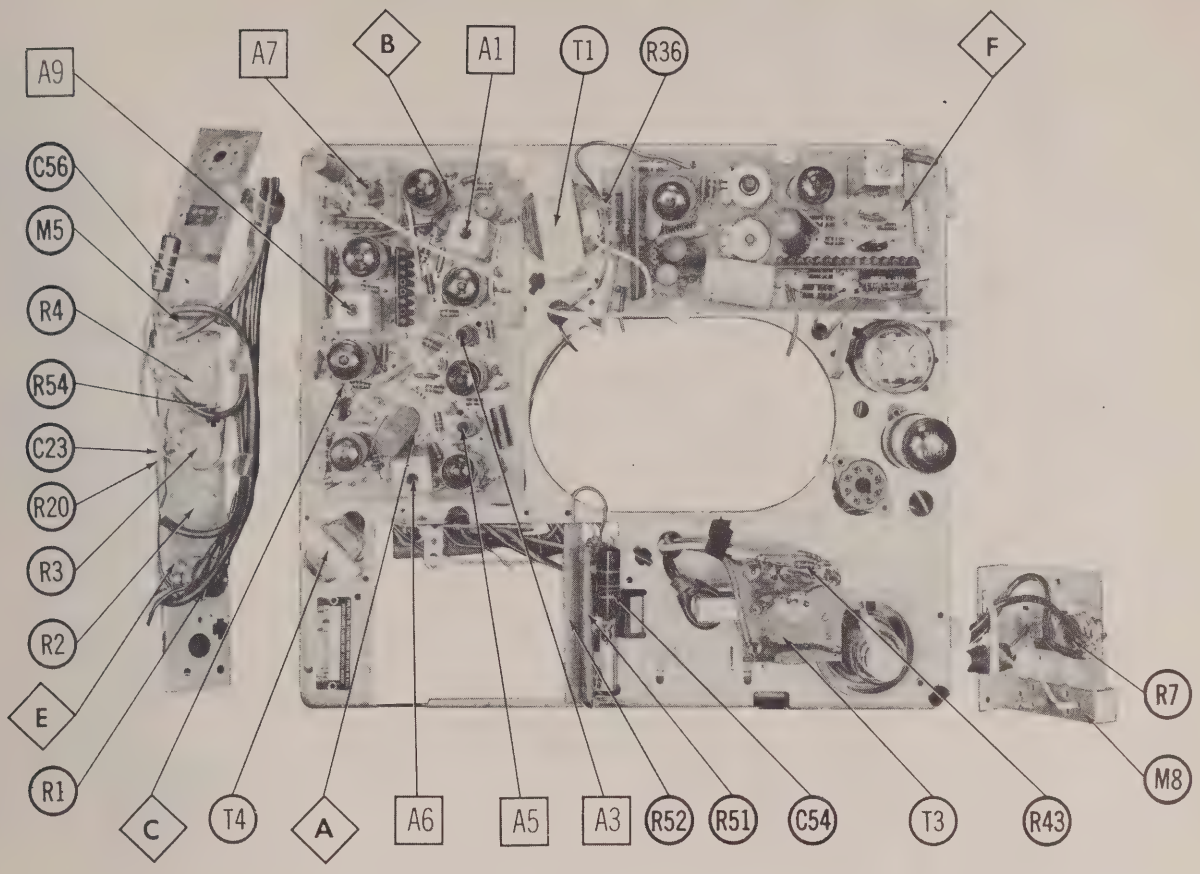
FOLDER 3



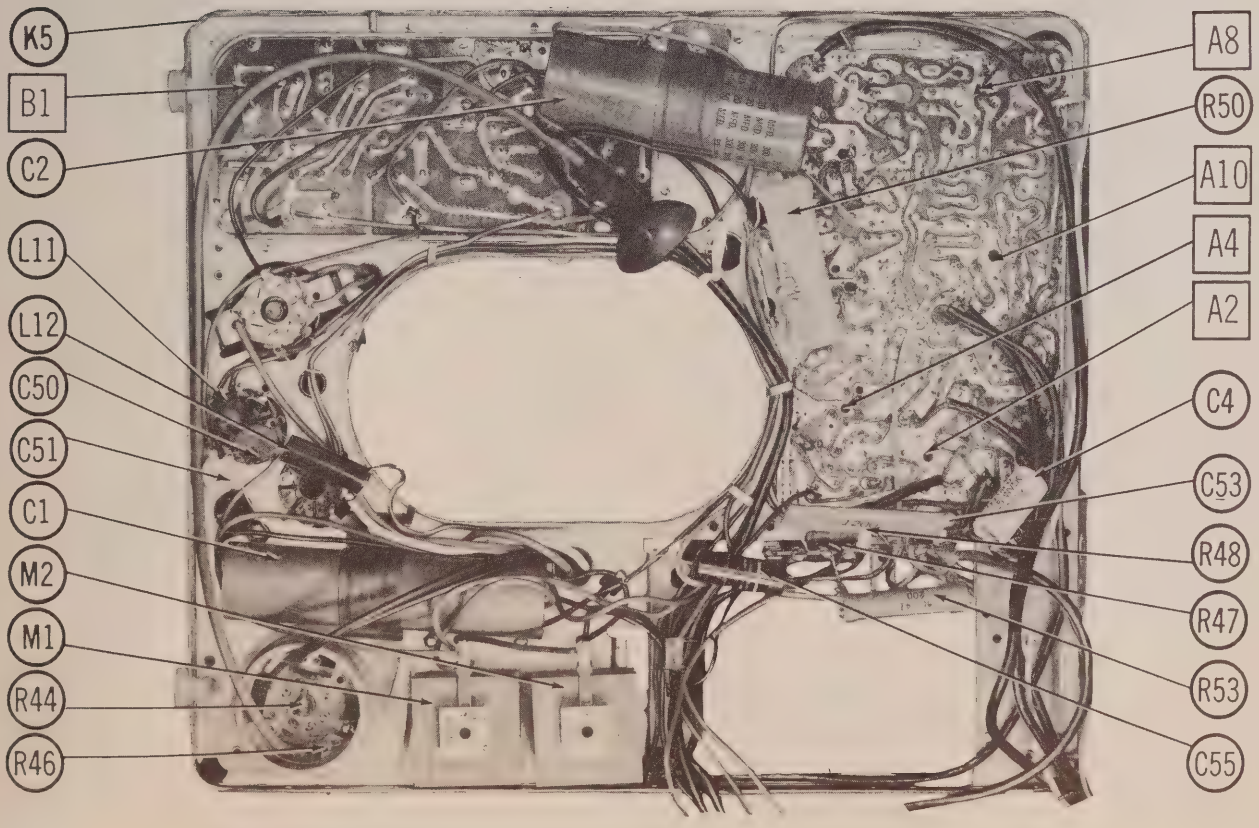
TUNER-TOP VIEW



SWEEP—PRINTED BOARD



CHASSIS TOP VIEW



CHASSIS-BOTTOM VIEW

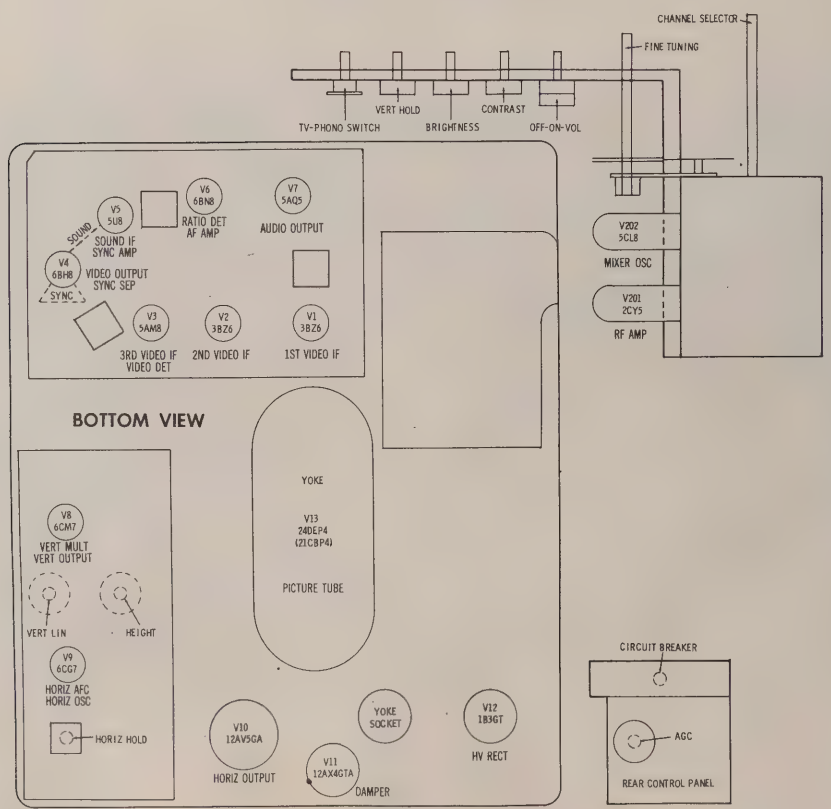
SILVERTONE CHASSIS 528.51106, 107, 108, 160, 161, 163, 164, 165, 166, 167, 168, 170, 171, 172, 173, 175, 180, 181, 183, 184, 185, 187, 190, 191, 193, 194, 240, 241, 242, 245, 250, 251, 253

FOLDER 3

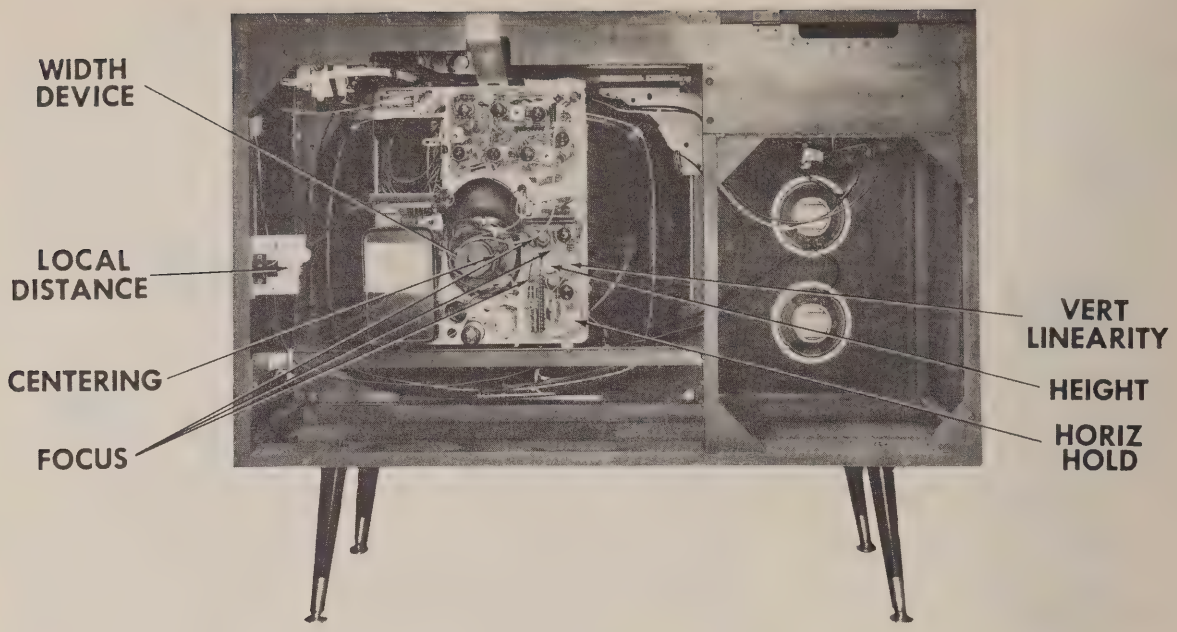
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BZ6	570K	56Ω	▪1.5Ω	▪2.5Ω	†1500Ω	†1500Ω	0Ω		
V2	3BZ6	570K	56Ω	▪2.5Ω	▪3.5Ω	†1500Ω	†1500Ω	0Ω		
V3	5AM8	220Ω	.1Ω	†2200Ω	▪3.5Ω	▪4.5Ω	†2200Ω	.1Ω	4700Ω	0Ω
V4	6BH8	0Ω	2.2meg	†470K	▪5.5Ω	▪4.5Ω	• 180Ω	1meg	†1200Ω	†5200Ω
V5	5U8	†9400Ω	3.7Ω	†70K	▪5.5Ω	▪6.5Ω	†3400Ω	270Ω	3300Ω	†470K
V6	6BN8	500K	0Ω	500K	▪6.5Ω	▪8Ω	18K	†220K	2.2meg	0Ω
V7	5AQ5	470K	270Ω	▪8Ω	▪9.5Ω	†1900Ω	†1500Ω	470K		
V8	6CM7	‡2000Ω	NC	0Ω	▪12Ω	▪11Ω	• ‡2.8meg	•650K	2.2meg	•1700Ω
V9	6CG7	†33K	460K	0Ω	▪13Ω	▪12Ω	†470Ω	1meg	330K	NC
V10	12AV5GA	470K	▪16Ω	0Ω	NC	‡53Ω	NC	▪13Ω	†6800Ω	
V11	12AX4GTA	TP	NC	¶	NC	†2.3Ω	NC	▪18Ω	▪16Ω	
V12	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡493Ω
V13	24AEP4	▪11Ω	62K	PIN 6 †470Ω	PIN 10 ‡28Ω	PIN 11 •600K	PIN 12 ▪9.5Ω			
V201	2CY5	•680K	0Ω	▪1.5Ω	▪1Ω	†1200Ω	†10K	0Ω		
V202	5CL8	15K	†9400Ω	0Ω	▪1Ω	▪0Ω	†3400Ω	†1200Ω	0Ω	225K

¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
• THIS READING MAY VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM OUTPUT OF M1.
‡ MEASURED FROM PIN 3 OF V13.
▪ MEASURED FROM JUNCTION OF C1A, C1B and C55.
NC NO CONNECTION.
TP TIE POINT.



TUBE PLACEMENT CHART



CABINET—REAR VIEW

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. The adjustments (located in a circle around the shaft) should be made in sequence from the highest to the lowest channel in the area. Channel 13 adjustment is located at 11 o'clock, proceed in a counter clockwise direction adjusting for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 6 wood screws from the trim strip at the top of the safety glass. Tilt glass out at the top and lift up to remove.

SPECIAL ADJUSTMENTS

A. AGC
Tune in an operating channel.
Turn contrast control fully clockwise.
Turn local-distance control (R7) fully counter clockwise.
Turn local-distance control slowly clockwise until the picture becomes unstable or a buzz is heard in the sound.
Turn the local-distance control slowly counter clockwise until the picture becomes stable and buzz is at a MINIMUM.
Check operation on all other channels operating in the area and if overloading (unstable picture and/or buzz) is evident, turn the local-distance control slowly counter clockwise until overloading disappears.
When all channels have been checked and are free of overloading, the local-distance control is properly adjusted.
Return the contrast to normal operating position.

B. Focus
The focus may be varied in steps by the position of a plug in the focus adjustment board.

C. Width
The width may be varied by means of a metallic sleeve located between the yoke and the picture tube neck. Adjust sleeve in or out of the yoke for a picture SLIGHTLY larger than necessary to fill the screen.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

The horizontal frequency coil is used as the horizontal hold control. Adjust the horizontal hold until the picture synchronizes horizontally. (For location, see tube placement chart.)

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (A10) located on top of chassis.

FUSE DEVICE

A circuit breaker is used for LV power supply protection and may be reset by depressing the reset button. (For location, see tube placement chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Tune in a TV station and adjust the horizontal hold until the picture synchronizes horizontally. If the picture cannot be synchronized with the horizontal hold, turn the waveform slug (B1) several turns out of the coil form from its original position. Readjust the horizontal hold until picture synchronizes horizontally.

Connect the vertical amplifier of the scope thru a low capacity probe to point (F). Connect low side to chassis. Retouch the horizontal hold to synchronize the picture.

Adjust the waveform slug (B1) for a waveform similar to Fig. 2 with the sharp peak approximately 10% higher than the broad peak. Keep the picture in sync during this adjustment with the horizontal hold. Remove scope connection and retouch horizontal hold, if necessary to synchronize picture horizontally.

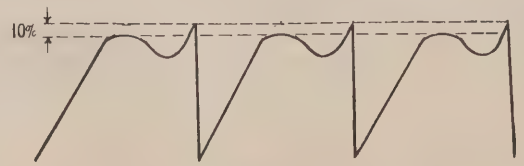


FIG. 2

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 9 IN SET 345

Motorola Chassis TS-537, Y, TTS-537, Y, WTS-537, Y were covered in Photofact Folder 9 — Set 345.

Late in production many new models and production changes were added.

Following is a complete list of all models and the chassis used in each.

Y21C6BG, MG	TS-537Y	21C6BG, MG	TS-537
Y21K53B, M	TTS-537Y	21K53B, M	TTS-537
Y21K53BA, MA	TS-537Y	21K53BA, MA	TS-537
Y21K55B, M	TTS-537Y	21K55B, M	TTS-537
Y21K55BA, MA	TS-537Y	21K55BA, MA	TS-537
Y21K64B, M	QTS-537Y	21K64B, M	QTS-537
Y21K65B, M	WTS-537Y	21K65B, M	WTS-537
Y21K66B, M,	TS-537Y	21K66B, M	TS-537
Y21K68B, M	WTS-537Y	21K68B, M	WTS-537
Y21T32B, CH	TTS-537Y	21T32B, CH	TTS-537
Y21T32BA, CHA, MGA	TS-537Y	21T32BA, CHA, MGA	TS-537
Y21T34B, M	TTS-537Y	21T34B, M	TTS-537
Y21T34BA, MA	TS-537Y	21T34BA, MA	TS-537
Y21T47MO	MTS-537Y	21T47MO	MTS-537
Y24C1B, M	PTS-537Y	24C1B, M	PTS-537
Y24K13B, M	WTS-537Y	24K13B, M	WTS-537
Y24K18B, M	PTS-537Y	24K18B, M	PTS-537
Y24T5BG, MG	WTS-537Y	24T5BG, MG	WTS-537

TS-537A-05

TO REDUCE LINE RADIATION

A .25mfd @ 400V capacitor is connected across the AC interlock.

A 10000mmf @ 500V ceramic disc capacitor is added from pin 2 of V14 (horizontal output) to ground.

C102 is increased from 5000mmf to 10000mmf.

C103 is increased from 5000mmf to 10000mmf.

TO IMPROVE AGC STABILITY

R44 is decreased from 1.2meg to 820K.

R122 is disconnected from the 110 voltage source and reconnected to the 235 voltage source.

TS-537A-05-1

TO IMPROVE HORIZONTAL SWEEP

R105 is decreased from 15K to 12K.

R104 is omitted.

MOTOROLA CH. MTS-537, Y, PTS-537, Y, QTS-537, Y, TS-537, Y, TTS-537, Y, WTS-537, Y

(Continued on Reverse Side)

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	COMPONENT CHANGE L30 (4.5MC trap) is changed to part #24B738942 in chassis coded A-05-1 only and C36 is increased from 27mmf to 33mmf.
TS-537A-06	TO INCREASE RANGE OF VERTICAL HOLD CONTROL R72 is decreased from 6.8meg to 5.6meg.
TS-537A-07	TO PROTECT FILAMENT STRING R111 is increased from 35Ω to 42Ω.
TS-537A-08 TS-537A-09	TO PREVENT ARCING AT VERTICAL SIZE CONTROL R79 is moved from the left lug to the right lug of R5 (vertical size). The bootstrap is moved from the right lug to the left lug of R5 (vertical size). Lug position is determined from the front of the control. L35 is changed to part #24K739630.
TS-537A-10	VOLTAGE RATING INCREASED The voltage rating of C90 and C91 is increased from 2000V to 3000V.
TS-537A-11	TO PROTECT VIDEO DETECTOR CRYSTAL DIODE A 5000mmf @ 500V ceramic disc capacitor and a 68K ½ watt resistor (wired in parallel) are connected from pin 7 of V6A (video output) to L29.
TS-537B-00	TO IMPROVE HORIZONTAL SWEEP The horizontal sweep circuit has been revised. A partial schematic showing the new circuit is given in Fig. 3. L42 (horizontal oscillator transformer) is changed to part #1V741946.
TS-537B-01 "Y" Version Only	TO REDUCE 43MC INTERFERENCE L3 (Antenna Coils, 2-6) is changed to part #24K742360. L2 (IF Trap) is changed to part #24B742202. C4 is decreased from 150mmf to 30mmf. With the above changes the tuner number becomes TT-86YB.
TS-537B-02	COMPONENT CHANGE R105 is increased from 12K to 15K.
TS-537B-03 VHF Chassis Only	TO REDUCE 43MC INTERFERENCE R11 is decreased from 1500Ω to 220Ω. L2 (IF Trap) is changed to part #24K742655. C4 is decreased from 150mmf to 15mmf. With the above changes the tuner number becomes TT-86B.
TS-537B-04	TO IMPROVE TUNER OSCILLATOR STABILITY A new cement is now used which prevents movement of the tuner oscillator coils. The tuner numbers now become TT-86C and TT-86YC.
"R" Suffix	"R" SUFFIX ADDED TO CHASSIS CODING Chassis with "R" suffix stamped as part of the chassis coding indicates that the horizontal output circuit change mentioned in TS-537B-02 above, is incorporated into that chassis.
PTS-537B-04	VHF TUNER CHANGED Chassis coded PTS-537B-04 use VHF Tuner VTT-96 and VTT-96Y. A schematic showing the new tuner is given in Fig. 1. COMPONENT CHANGES V6 (Video Output-AGC Keying) is changed from 6AU8 to 8CX8. The wattage rating of R112 is increased from 2 watts to 3 watts.

	C57 is increased from 5mmf to 6.8mmf. T1 (Horizontal Output Trans.) is changed to part #24K743872. A surge protection resistor, 200Ω Cold - 6Ω Hot, is added between R111 and R113 (Part #6B744326).
MTS-537C-00	VHF TUNER CHANGED Chassis coded MTS-537C-00 use VHF Tuner MTT-86 and MTT-86Y and are similar to the tuners covered, except for shaft length. COMPONENT CHANGES V6 (Video Output-AGC Keying) is changed from 6AU8 to 8CX8. The wattage rating of R112 is increased from 2 watts to 3 watts. C57 is increased from 5mmf to 6.8mmf. A surge protection resistor, 200Ω Cold - 6Ω Hot, is added between R111 and R113 (Part #6B744326). HORIZONTAL SWEEP AND HI-VOLTAGE CIRCUITS REVISED The horizontal sweep and hi-voltage circuits have been revised. A partial schematic showing the new circuits is given in Fig. 2. PICTURE TUBE CHANGED V17 (picture tube) is changed from 21ATP4A/B to 21CBP4.

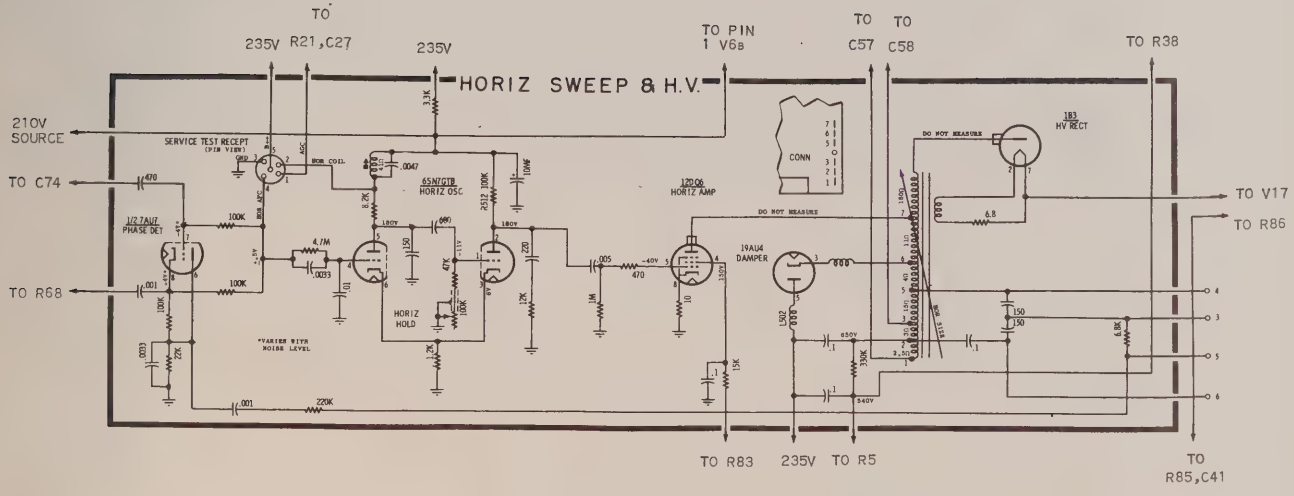


FIGURE 3.

Schematic Courtesy of Motorola, Inc.

(Continued on Reverse Side)

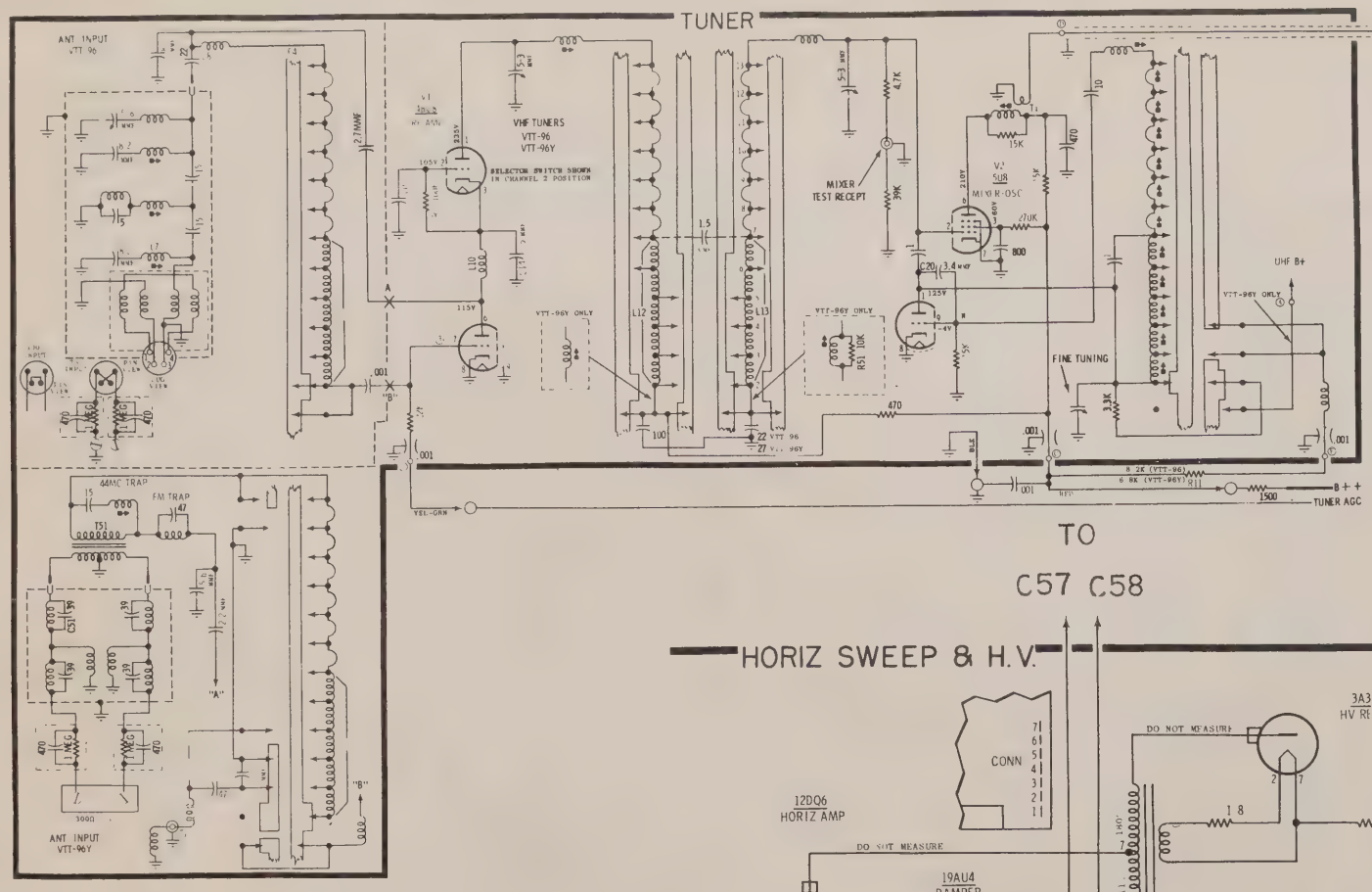


FIGURE 1. VTT-96 TUNER SCHEMATIC

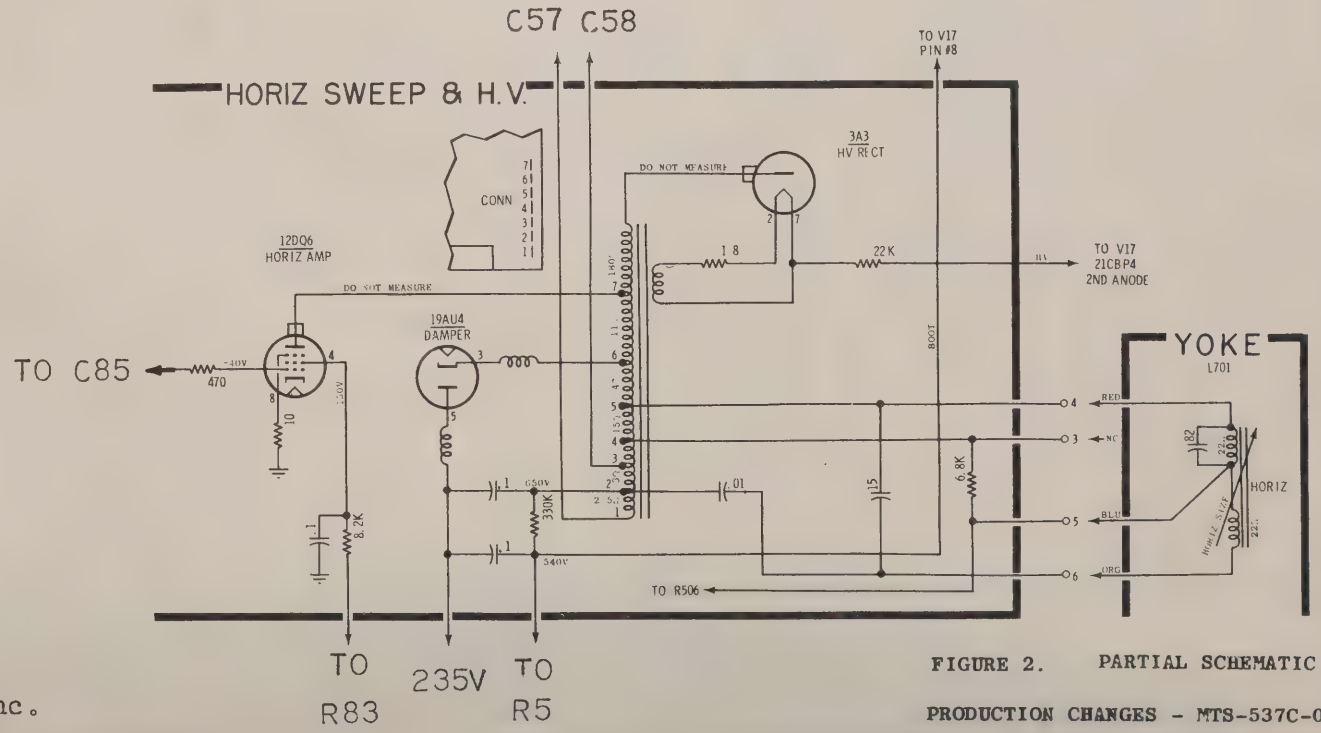


FIGURE 2. PARTIAL SCHEMATIC

Schematic Courtesy Of Motorola, Inc.

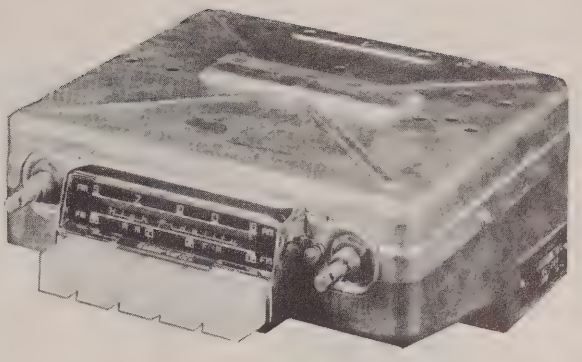
PHOTOFACT* Folder

*TRADE MARK

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

BECKER MODELS "Europa" MU, MUK

BECKER MODELS
"Europa" MU, MUK



BECKER MODELS
"Europa" MU, MUK

TRADE NAME	Becker Models Europa MU, Europa MUK		
SUPPLIER	Witte Import Distributors, 613-19 S. 24th St., Philadelphia 46, Pa.		
TYPE SET	Battery Operated Universal FM-BC Receiver (Model Europa MU Has Marine Band)		
TUBES (Six)	Types 6AQ8/ECC85 FM AM RF Amp.-FM Conv., 6AJ8/ECH81 1st FM IF Amp.-AM Mixer-AM Osc., EBF89 2nd FM IF Amp.-AM IF Amp.-AM Det.-AVC, 6DA6/EF89 Limiter, 6T8/EABC80 Ratio Det.-AF Amp., 6BQ5/EL84 Output (Some Versions Have Push-Pull Output)		
POWER SUPPLY	Storage Battery (6 Volt or 12 Volt)	RATING	2.71 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	510KC - 1630KC	FREQ. MOD.	88MC - 108MC

SET 397 FOLDER 5

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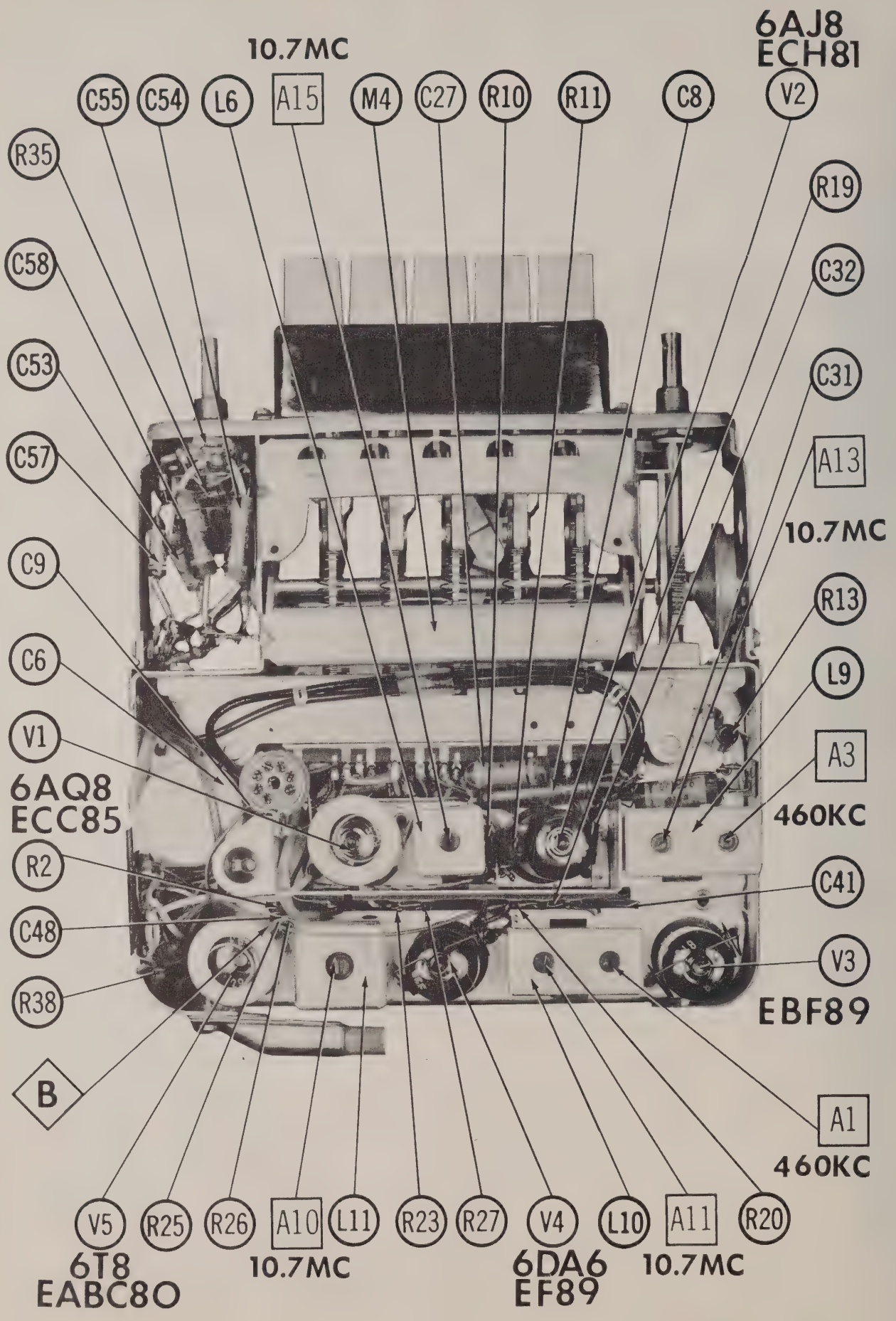


CHASSIS TOP VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01mfd	High side to pin 2 (grid) of 6AJ8/ECH81 (V2). Low side to chassis.	460KC (400∿ Mod)	AM	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	Fig. 1	Thru dummy to antenna receptacle	1630KC	"	"	"	A5	"
3.	"	"	510KC	"	Tune to 510KC signal	"	A6	"
4.	"	"	562KC	"	Tune to 562KC signal	"	A7, A8	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100K (±1%) resistors in series from point Ⓐ to chassis. The junction of these two resistors is alignment point Ⓒ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	.01mfd	High side to pin 2 (grid) of 6DA6/EF89 (V4). Low side to chassis.	10.7MC (Unmod)	FM	Point of non-interference	DC probe to point Ⓐ. Low side to chassis.	A9	Adjust for maximum deflection.
6.	"	"	"	"	"	DC probe to point Ⓑ. Common to point Ⓒ.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
7.	"	High side to pin 2 (grid) of 6AJ8/ECH81 (V2). Low side to chassis.	"	"	"	DC probe to point Ⓐ. Low side to chassis.	A11, A12, A13, A14	Adjust for maximum deflection.
8.		Across antenna receptacle	"	"	"	DC probe to point Ⓐ. Low side to chassis.	A15, A16	"

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	.01mfd	High side to pin 2 (grid) of EF89/ (V4). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference.	Vert. Amp. to point Ⓐ. Low side to chassis.	A9	Disconnect stabilizing capacitor C5. Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.
6.	"	"	"	"	"	Vert. Amp. to point Ⓑ. Low side to chassis.	A10	Reconnect C5. Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 3. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.
7.	"	High side to pin 2 (grid) of ECH81 (V2). Low side to chassis.	"	"	"	Vert. Amp. to point Ⓐ. Low side to chassis.	A11, A12, A13, A14	Disconnect C5. Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.
8.		Across antenna receptacle	"	"	"	"	A15, A16	Adjust for curve of maximum amplitude and symmetry similar to Fig. 2. Reconnect C5.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9.		Across antenna receptacle in parallel with 180Ω carbon resistor.	86MC	FM	Tuning gang fully closed	DC probe to point Ⓐ. Common to chassis.	A17	Adjust for maximum deflection.
10.		"	91MC	"	Tune for 91MC signal	"	A18	Adjust for maximum deflection.

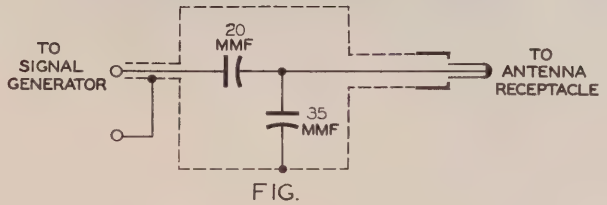


FIG.

FIG. 2

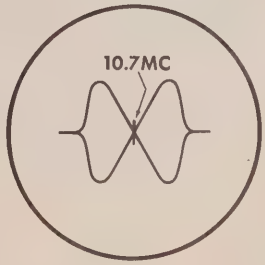
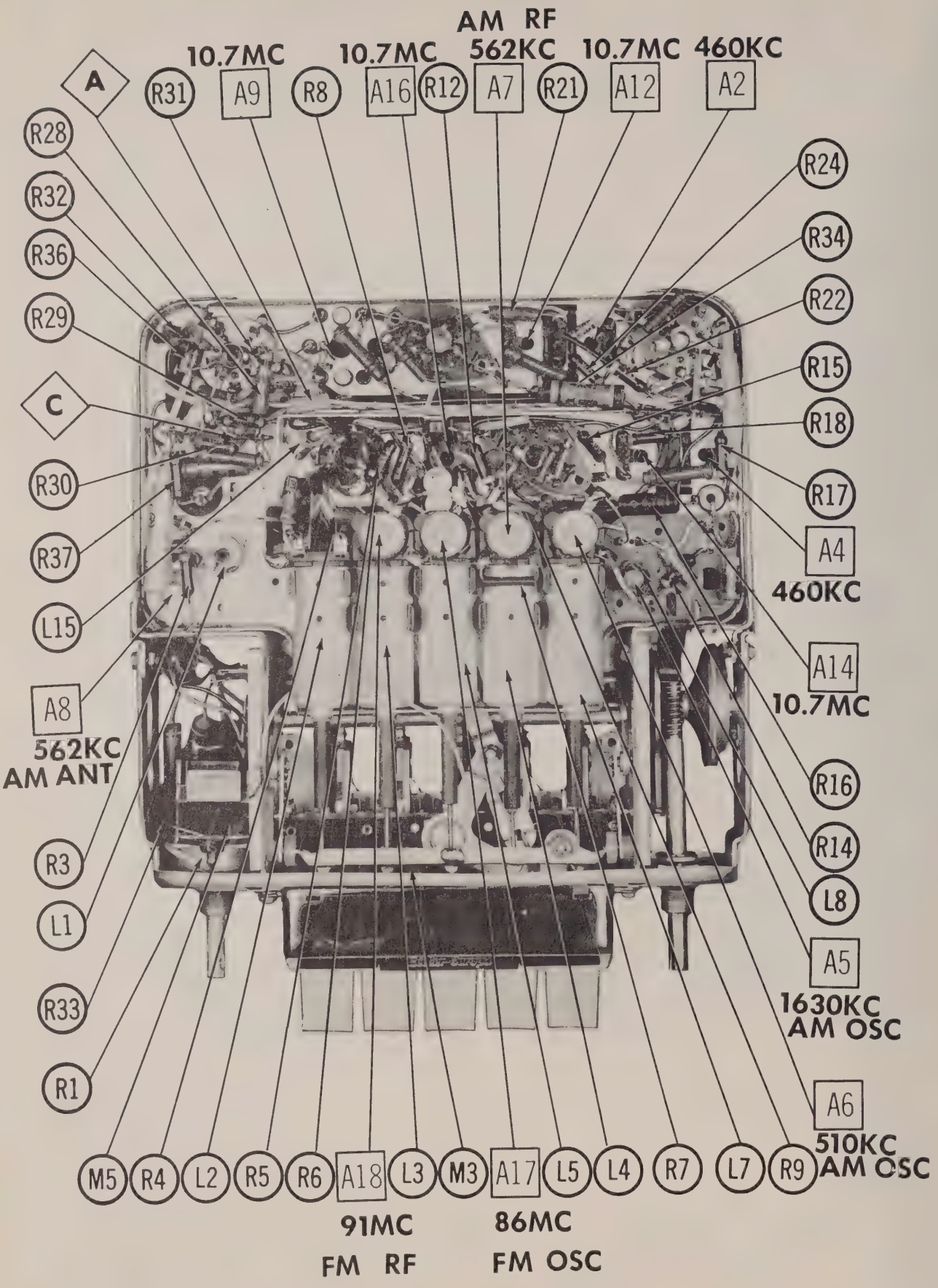
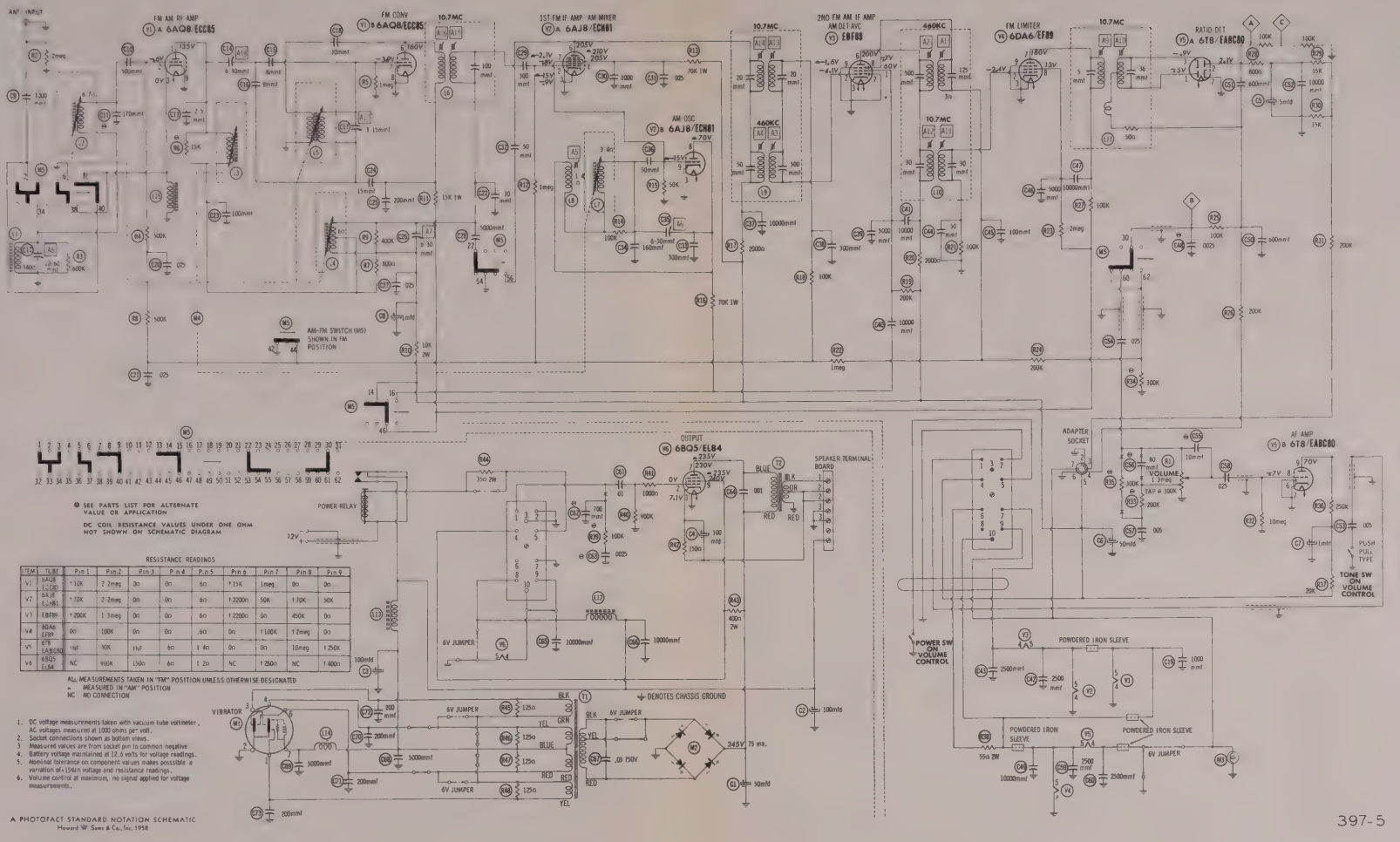
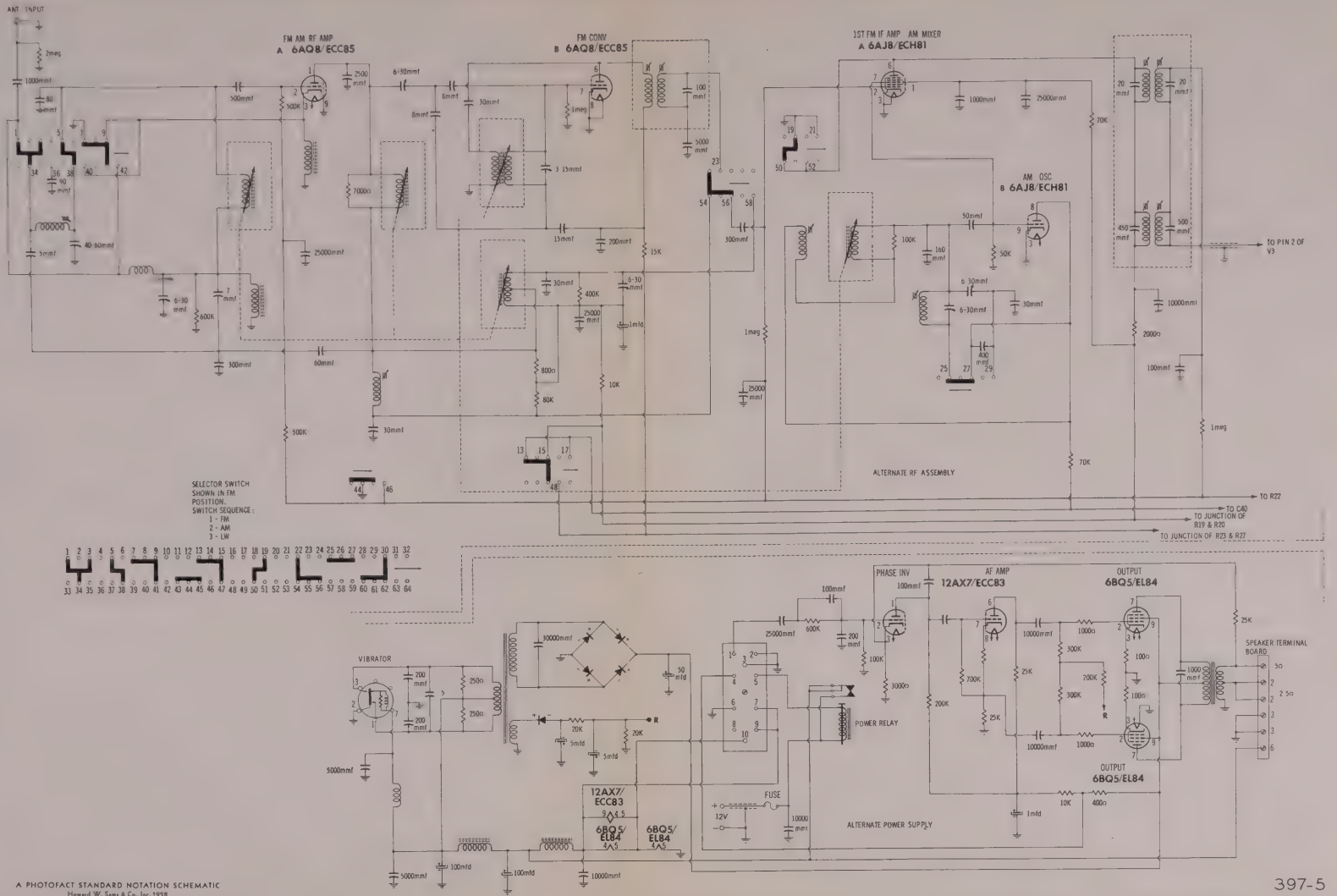


FIG. 3



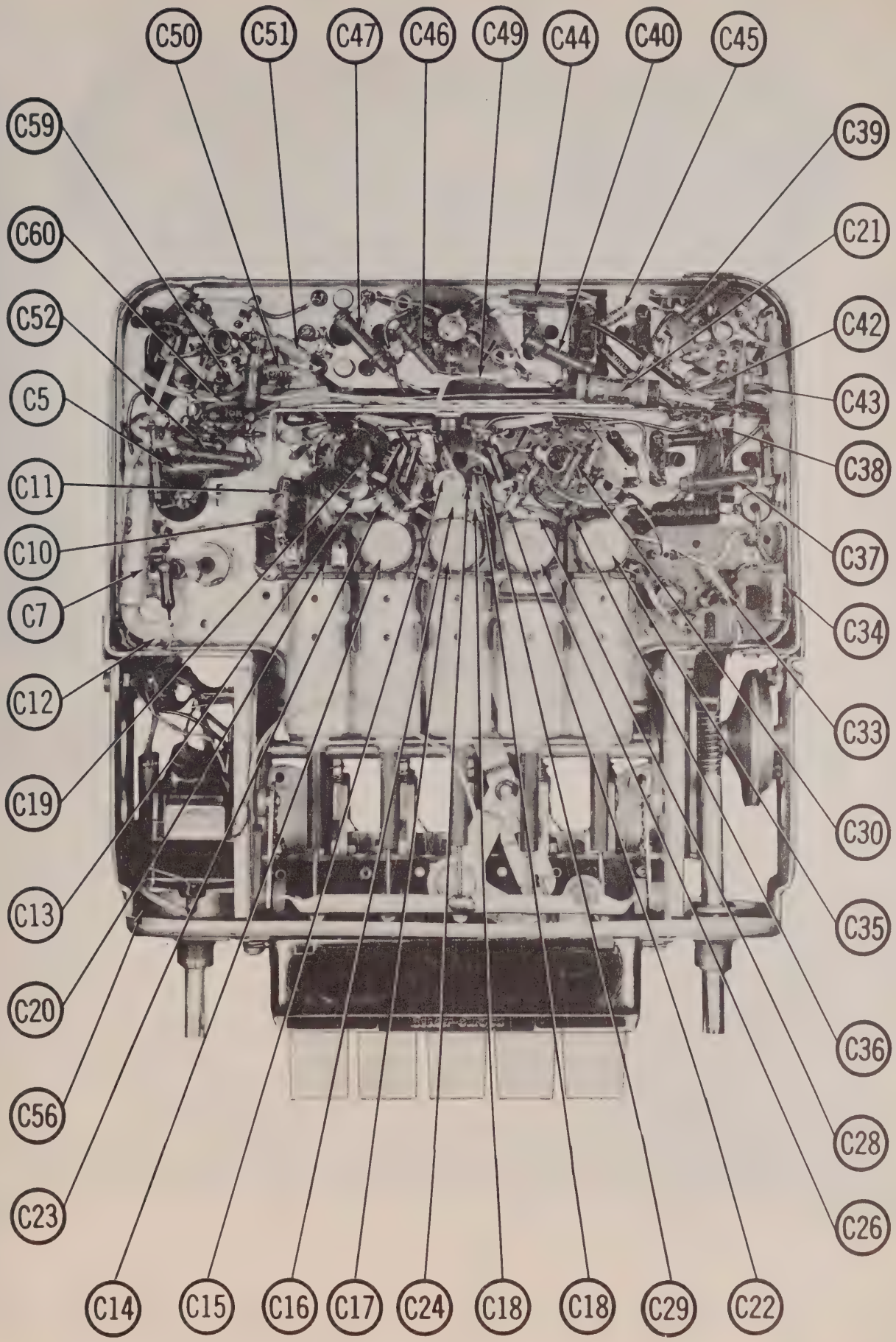
CHASSIS-BOTTOM VIEW


ANT. INPUT
FM AM RF AMP
V1 A 6AQ8/ECC85
FM CONV
V1 B 6AQ8/ECC85
10.7MC
1ST FM IF AMP AM MIXER
V2 A 6AJ8/ECH81
AM OSC
V2 B 6AJ8/ECH81
10.7MC
460KC
2ND FM AM IF AMP
AM DET AVC
V3 EBF89
460KC
10.7MC
FM LIMITER
V4 6DA6/EF89
10.7MC
RATIO DET
V5 A 6T8/EABC80
AM-FM SWITCH (W5) SHOWN IN FM POSITION
OUTPUT
V6 6BQ5/EL84
SPEAKER TERMINAL BOARD
ADAPTER SOCKET
AF AMP
V5 B 6T8/EABC80
VOLUME
TAP @ 100K
PUSH PULL TYPE
TONE SW ON VOLUME CONTROL
POWER SW ON VOLUME CONTROL
POWDERED IRON SLEEVE
POWDERED IRON SLEEVE
POWDERED IRON SLEEVE
6V JUMPER
6V JUMPER
6V JUMPER
6V JUMPER
VIBRATOR
POWER RELAY
DENOTES CHASSIS GROUND
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
RESISTANCE READINGS
ITEM
TUBE
Pin 1
Pin 2
Pin 3
Pin 4
Pin 5
Pin 6
Pin 7
Pin 8
Pin 9
V1
6AQ8 ECC85
V2
6AJ8 ECH81
V3
EBF89
V4
6DA6 EF89
V5
6T8 EABC80
V6
6BQ5 EL84
ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED
= MEASURED IN "AM" POSITION
NC NO CONNECTION
1. DC voltage measurements taken with vacuum tube voltmeter. AC voltages measured at 1000 ohms per volt.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958
397-5

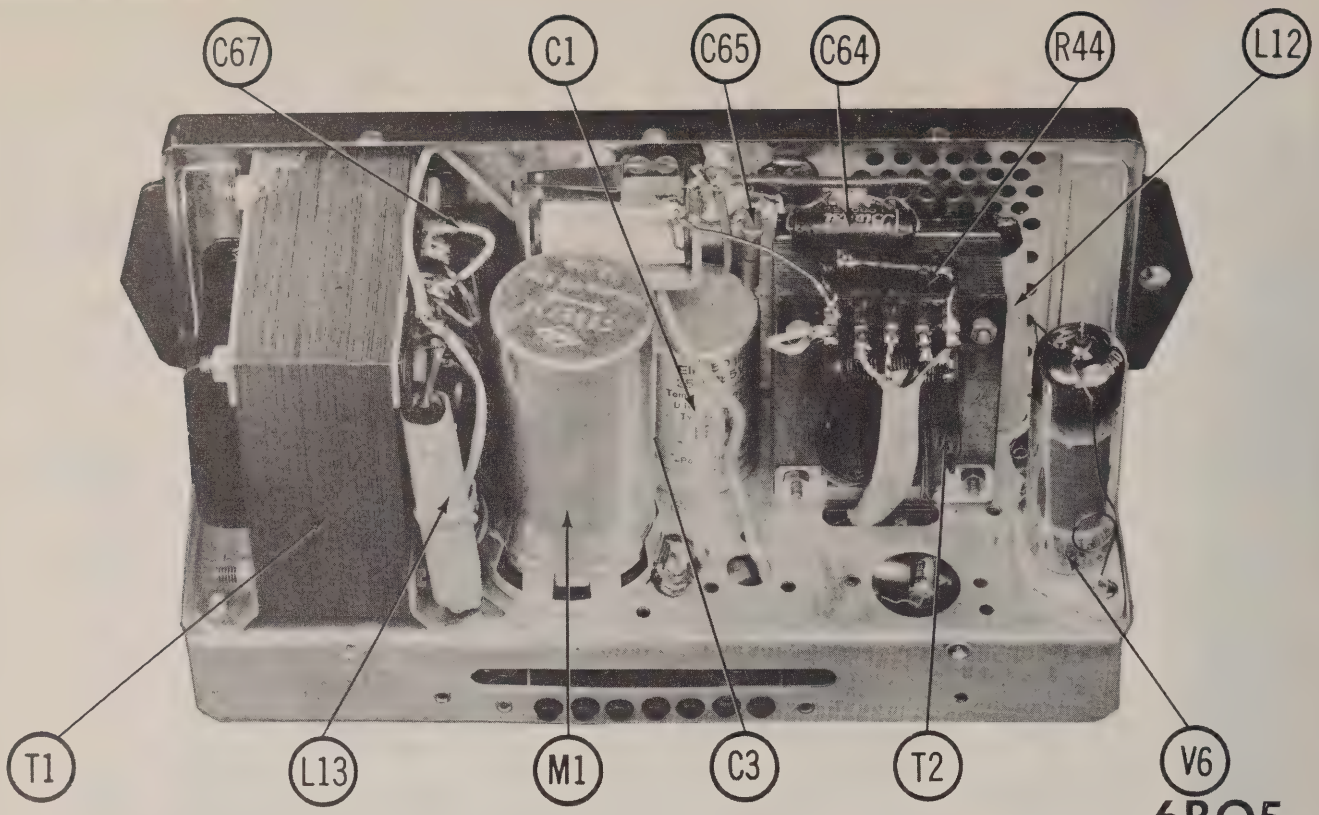


A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

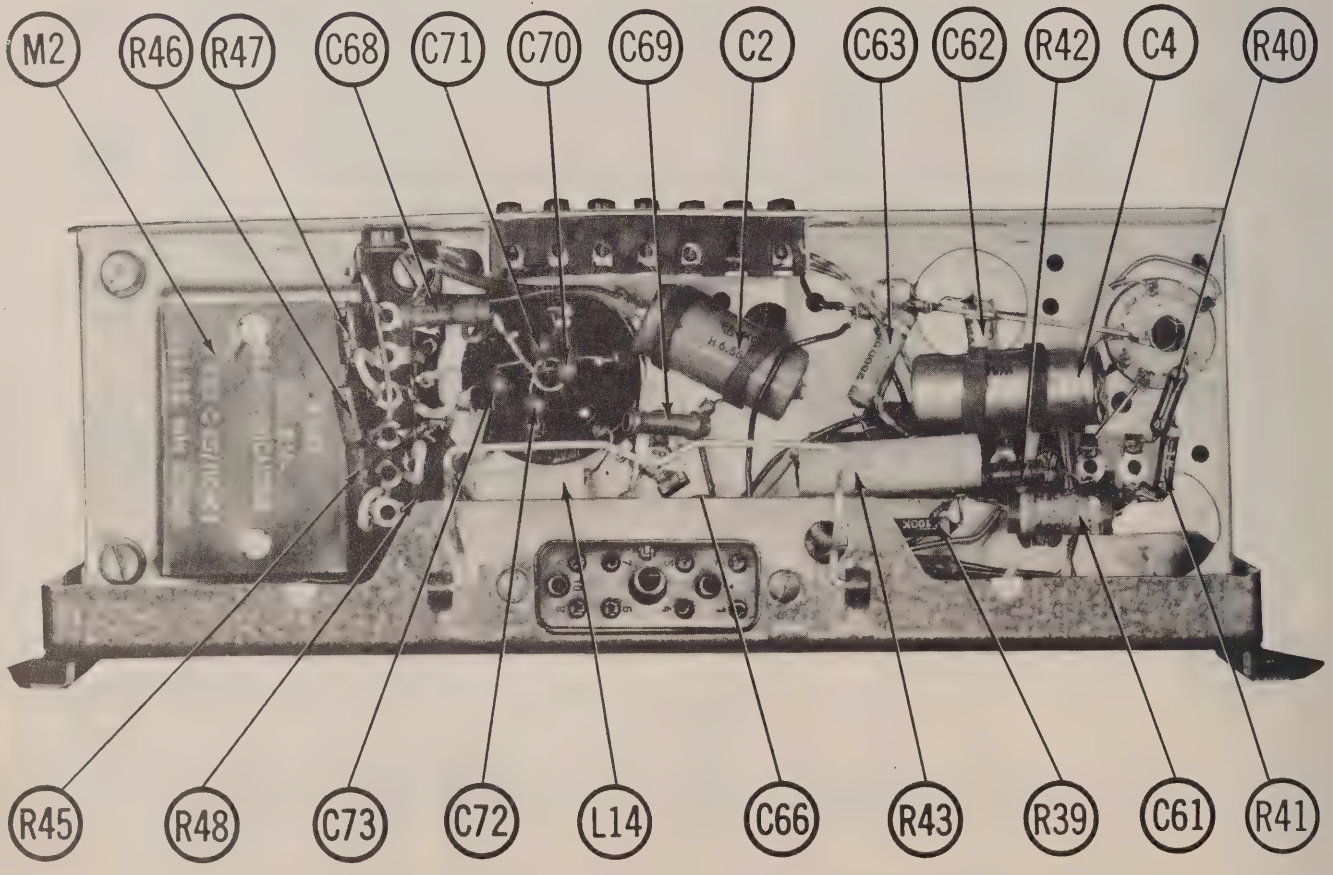
397-5



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



POWER CHASSIS - TOP VIEW



POWER CHASSIS - BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	FM AM RF Amp. -FM Conv.	6AQ8/ECC85
V2	1st FM IF Amp. -AM Mixer-AM Oscillator	6AJ8/ECH81
V3	2nd FM AM IF Amp. - AM Det. - AVC	EBF89
V4	FM Limiter	6DA6/EF89
V5	Ratio Det. - AF Amp.	6T8/EABC80
V6	Output	6BQ5/EL84

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	BECKER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	50	385							R2652 *
C2	100	25		PRS25V100	BBR100-25	TC2501	TD-100-25	MTH-2510	TVA-1207
C3	100	25		PRS25V100	BBR100-25	TC2501	TD-100-25	MTH-2510	TVA-1207
C4	100	25		PRS25V100	BBR100-25	TC2501	TD-100-25	MTH-2510	TVA-1207
C5	5	40		PRS50V5	BBR5-50	TC30	TD-5-50	MT-0504	TVA-1303
C6	50	385							
C7	1	385		PRS450V1	BR145			MMT-4501	R2622 *
C8	1	385		PRS450V1	BR145			MMT-4501	R2622 *

* Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	BECKER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C9	1000			1468-001	D6-102	1W5D1	ED-1000	MC255	1FM-21	
C10	500			1468-0005	D6-501	5W5T5	ED-500	MC245	1FM-35	①
C11	170									
C12	10-60									
C13	2.5									
C14	6-30									
C15	8					C10V8C				
C16	8					C10V8C				
C17	3-15									
C18	30									
C19	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C20	.025	125		P288N-025		CUB4S22		GEM-4125	4TM-S25	
C21	.025	125		P288N-025		CUB4S22		GEM-4125	4TM-S25	
C22	30			1468-00003	DD-300	5W5Q3	ED-30		1FM-43	
C23	100			1468-0001	D6-101	5W5T1	ED-100	MC235	1FM-31	
C24	15			1468-000015	D6-150	5W5Q15	ED-15	UC-5415	1FM-415	
C25	200			1468-0002	D6-201	5W5T2	ED-200	MC237	1FM-32	
C26	6-30									
C27	.025	500		P688N-025		CUB4S22		GEM-4125	6TM-S25	
C28	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C29	300			1468-0003	D6-301	5W5T3	ED-300	MC241	1FM-33	
C30	1000			SI 1000	D6-102	LT6D1	GP-1000	UC-521	5HK-D1	
C31	.025	500		P688N-025		CUB4S22		GEM-6125	6TM-S25	
C32	50			1468-00005	D6-500	5W5Q5	ED-50	MC225	1FM-45	
C33	300			1468-0003	D6-301	5W5T3	ED-300	MC241	1FM-33	
C34	160					5W5T16			1FM-316	
C35	6-30									
C36	50			1468-00005	D6-500	5W5Q5	ED-50	MC225	1FM-45	
C37	10000			SI 10000	D6-103	LT6S1	GP-10000	DC511	5HK-S1	
C38	300			1468-0003	D6-301	5W5T3	ED-300	MC241	1FM-33	
C39	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5HK-D5	
C40	10000			SI 10000	D6-103	LT6S1	GP-10000	DC511	5HK-S1	
C41	10000			SI 10000	D6-103	LT6S1	GP-10000	DC511	5HK-S1	
C42	2500			BPD-0025	DD-252	BYA10D25	ED-0025	UC-5225	5HK-D25	
C43	2500			BPD-0025	DD-252	BYA10D25	ED-0025	UC-5225	5HK-D25	
C44	50			1468-00005	D6-501	5W5Q5	ED-50	MC225	1FM-45	
C45	100			1468-0001	D6-101	5W5T1	ED-100	MC235	1FM-31	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	BECKER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C46	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5HK-D5	
C47	10000			SI 10000	D6-103	SI 10000	GP-10000	DC511	5HK-S1	
C48	.0025	125			D6-252	CUB6D22	GP-2500	GEM-6225	6TM-D25	②
C49	10000			SI 10000	DD-103	LT6S1	ED-01	DC511	5HK-S1	
C50	600				D6-601	1W5T6			1FM-36	
C51	600				D6-601	1W5T6			1FM-36	
C52	10000			SI 10000	D6-103	LT6S1	GP-10000	DC511	5HK-S1	
C53	.005	500		P688N-005	D6-502	CUB6D5	GP-5000	GEM-625	6TM-D5	
C54	.025	125		P288N-025		CUB4S22		GEM-4125	4TM-S25	
C55	10			1468-00001	D6-100	5W5Q1	ED-10	MC215	1FM-41	③
C56	80									④
C57	.005	125		P288N-005	D6-502	CUB6D5	GP-5000	GEM-425	6TM-D5	
C58	.025	125		P288N-025		CUB4S22		GEM-4125	4TM-S25	
C59	2500			BPD-0025	DD-252	BYA10D25	ED-0025	UC-5225	5HK-D25	
C60	2500			BPD-0025	DD-252	BYA10D25	ED-0025	UC-5225	5HK-D25	
C61	.01	600		P688N-01	D6-103	CUB6S1	GP-10000	GEM-611	6TM-S1	
C62	700					1W5T7				④
C63	.0025	500		P688N-0025	D6-252	CUB6D22	ED-0025	GEM-6225	6TM-D25	④
C64	.001	750		P1088N-001		CUB10D1		GEM-1021	10TM-D1	
C65	10000			SI 10000	D6-103	LT6S1	GP-10000	DC511	5HK-S1	
C66	10000			SI 10000	D6-103	LT6S1	GP-10000	DC511	5HK-S1	
C67	.03	750		P1088N-03		CUB10S3		GEM-1013	10TM-S3	
C68	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C69	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C70	200			BPD-0002	DD-201	L10T2	ED-200	UC-532	5GA-T2	
C71	200			BPD-0002	DD-201	L10T2	ED-200	UC-532	5GA-T2	
C72	200			BPD-0002	DD-201	L10T2	ED-200	UC-532	5GA-T2	
C73	200			BPD-0002	DD-201	L10T2	ED-200	UC-532	5GA-T2	

① Not used in Model MUK.
② Some versions may use 2500mmf in this application.
③ Some versions may use 100mmf in this application.
④ Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	BECKER PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1.3meg	½						Volume, Tap ② 300K
B	Switch							Tone
C	Switch							On-Off

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	BECKER PART No.	NOTES
R2	2meg			
R3	600K			
R4	500K			
R5	1meg			
R6	15K			①
R7	800Ω			
R8	500K			
R9	400K			
R10	10K	2		
R11	15K	1		
R12	1meg			
R13	70K	1		
R14	100K			
R15	50K			
R16	70K	1		

ITEM No.	RATING OHMS	RATING WATT	BECKER PART No.	NOTES
R17	2000Ω			
R18	100K			
R19	200K			
R20	2000Ω			
R21	100K			
R22	1meg			
R23	2meg			
R24	200K			
R25	100K			
R26	200K			
R27	100K			
R28	800Ω			
R29	15K			
R30	15K			
R31	200K			

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	BECKER PART No.	NOTES
R32	10meg			
R33	200K			②
R34	300K			③
R35	300K			④
R36	250K			
R37	20K			
R38	55Ω	2		
R39	100K			④
R40	900K			

ITEM No.	RATING OHMS	RATING WATT	BECKER PART No.	NOTES
R41	1000Ω			
R42	150Ω			
R43	400Ω	2		
R44	35Ω	2		
R45	125Ω			
R46	125Ω			
R47	125Ω			
R48	125Ω			

① Some versions may use 7000Ω in this application.
② Some versions may use 100K in this application.
③ Some versions may use 200K in this application.
④ Not used in some versions.

TRANSFORMER (VIBRATOR)

ITEM No.	RATING PRI. 1	RATING PRI. 2	RATING PRI. 3	RATING SEC.	REPLACEMENT DATA BECKER PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
	12VDC OPERATION									
T1	12V @ 1.5A	24VCT @ 1.5A	12V @ 1.5A	220V Tap @ 200V @ .060A						
	6VDC OPERATION									
	3V @ .75A	12VCT @ 1.5A	3V @ .75A	220V Tap @ 200V @ .060A						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	TURNS RATIO PRI.	TURNS RATIO SEC.	REPLACEMENT DATA BECKER PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	34:	1								

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA BECKER PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	AM Antenna Coil						
L2	AM Antenna Coil						
L3	FM RF Coil						
L4	AM Mixer Coil						
L5	FM Osc. Coil						
L6	1st FM IF						
L7	AM Osc. Coil						
L8	AM Osc. Coil						
L9	2nd FM IF						
	1st AM IF						
L10	3rd FM IF						
	3nd AM IF						
L11	Ratio Det.						
L12	Fil. Choke						
L13	Hash Choke						
L14	RF Choke						2.8 Microhenries
L15	Cathode Choke						

PARTS LIST AND DESCRIPTIONS (Continued)

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA BECKER PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	NOTES
M1	Interrupter	12VDC	115∿	6302/12		G4502		

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA BECKER PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M2	.075A			60-9150 ① ③	D-64 ①	① Selenium Type ② Silicon Type ③ Two Required

MISCELLANEOUS

ITEM No.	PART NAME	BECKER PART No.	NOTES
M3	Dial Lamp		12-14V .1A
M4	Tuner		Pushbutton, 5 Section, Variable Inductance
M5	Switch		AM-FM (Multiple Contact, Slide-Type)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire ..... Use BELDEN No. 8885
Bonding Strap ..... Use BELDEN No. 8661

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

BELL SOUND MODEL 2315

BELL SOUND
MODEL 2315

BELL SOUND
MODEL 2315

TRADE NAME	Bell Sound Model 2315
MANUFACTURER	Bell Sound Systems, Inc., 555 Marion Road, Columbus 7, Ohio
TYPE SET	AC Operated 6 Channel 12 Watt Audio Amplifier
TUBES (Six)	Types 12AX7/ECC83 Phono Preamplifier, 12AX7/ECC83 AF Amplifier, 12AX7/ECC83 AF Amp.-Phase Inv., (2) 6V6GT Output, 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC -60 Cycles RATING .74 Amp. @ 117 Volts AC (75 Watts)

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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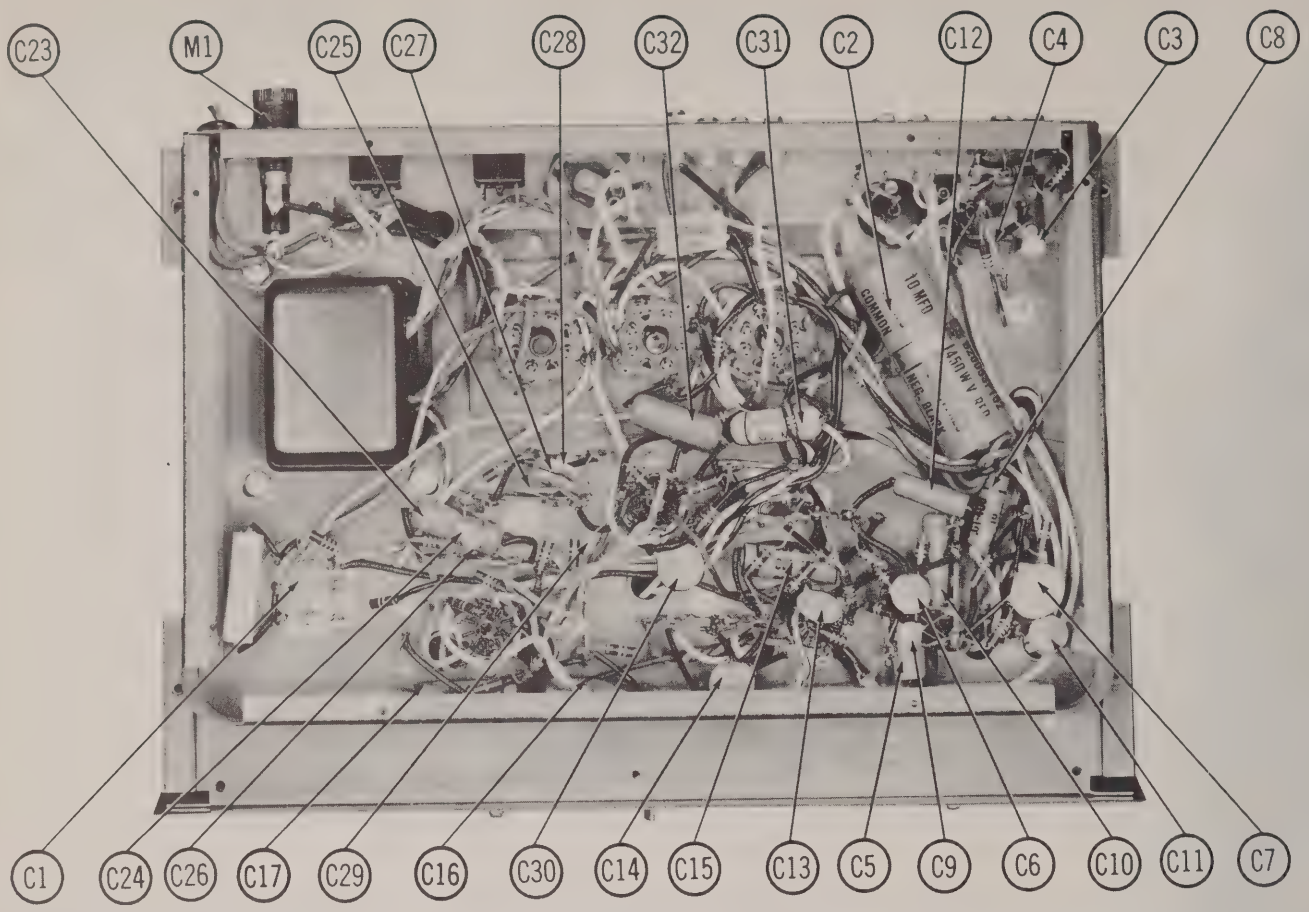
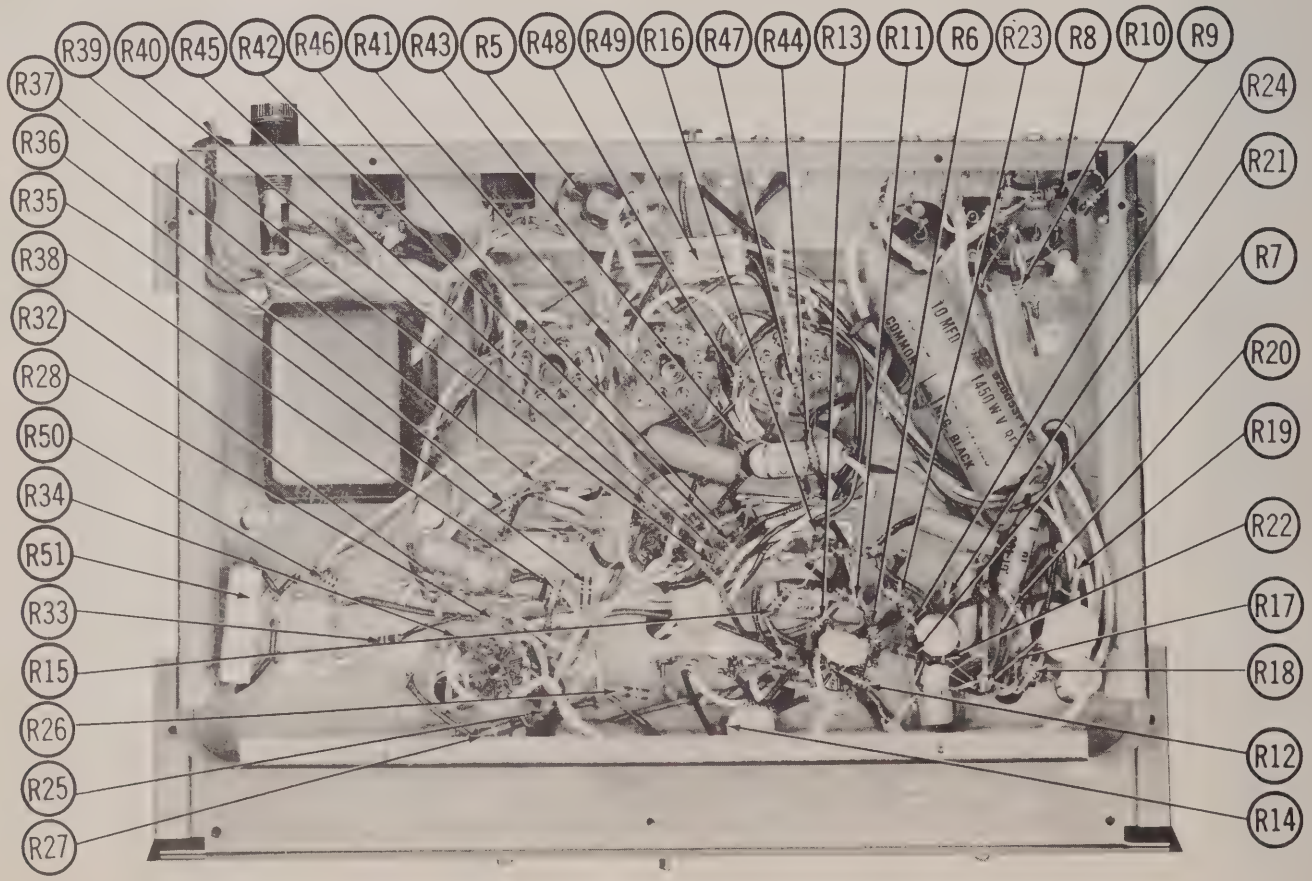


CHASSIS BOTTOM VIEW CAPACITOR AND MISCELLANEOUS IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	Phono Preamplifier	12AX7/ECC83
V2	AF Amplifier	12AX7/ECC83
V3	AF Amp. - Phase Inv.	12AX7/ECC83

ITEM No.	USE	TYPE
V4	Output	6V6GT
V5	Output	6V6GT
V6	Rectifier	5Y3GT

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	BELL SOUND PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	450							R2555 *
B	■15	450							
C	▲10	450							
D	100	50							
C2A	10	450		PRS450V1010	BBRT11145	TCD72	TDLD-26	MTD-4510	TVA-2722
B	10	450							

* Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

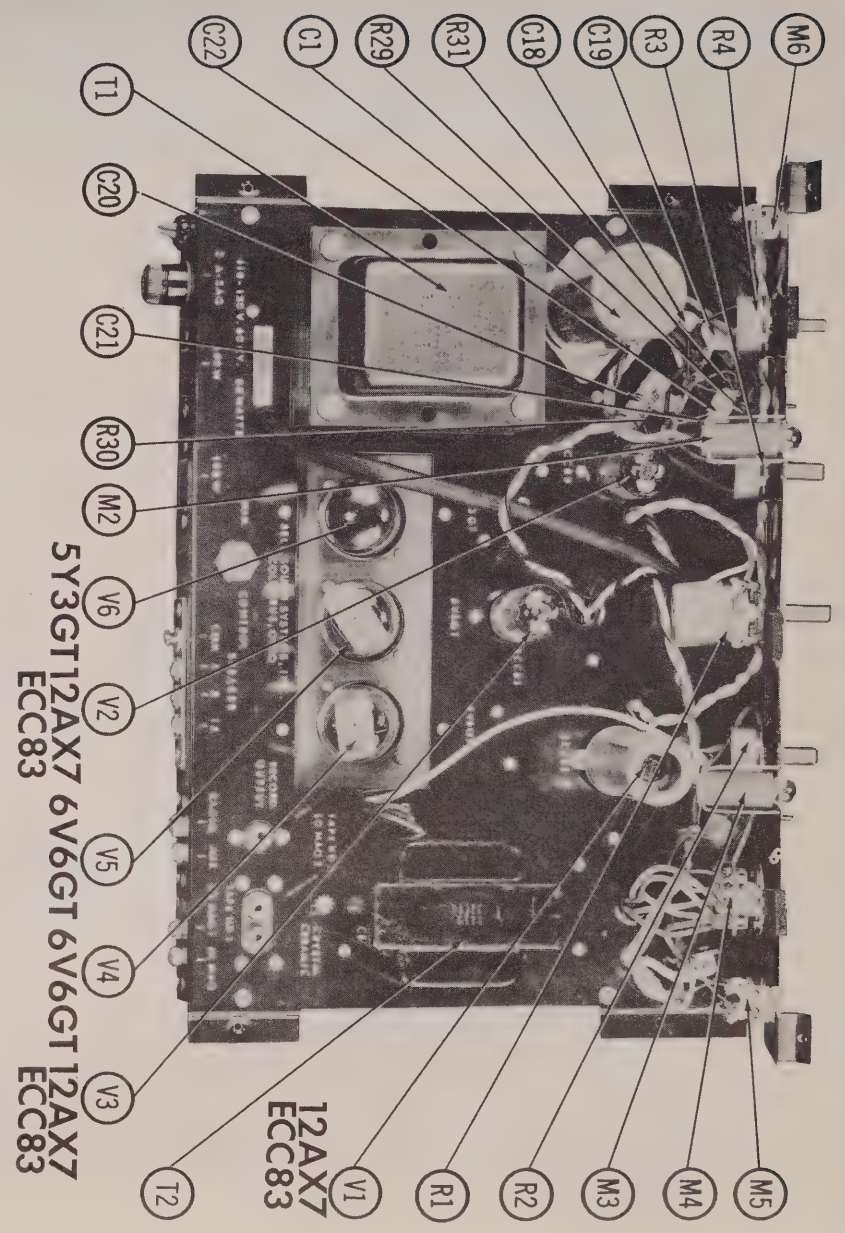
ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	BELL SOUND PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	200				TCZ-200	L10T2	ED-200	MCB237	MS-32	10%
C4	68			NPO-DI 68	TCZ-68	C10Q68C	TCO-68		5TCC-Q68	10% NPO
C5	.05	400		P488N-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C6	2400					1R5D24	CY20C242J		MS-224	10%
C7	5000					1R5D5		MCB465	MS-25	10%
C8	.01	400						GEM-1611		10%
C9	470				D6-471	5R5T47	ED-470		MS-324	10%
C10	.025	400								10%
C11	2400					1R5D24	CY20C242J		MS-224	10%
C12	.01	400						GEM-1611		10%
C13	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C14	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C15	.05	400		P488N-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C16	.1	200		P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	①
C17	.05	400		P488N-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C18	240				D6-241	L10T24	ED-240		MS-324	10%
C19	2400					1R5D24	CY20C242J		MS-224	10%
C20	.01	400						GEM-1611		10%
C21	1000					1R5D1	ED-1000	MCB255	MS-21	10%
C22	68			NPO-DI 68	TCZ-68	C10Q68C	TCO-68		5TCC-Q68	10% NPO
C23	.1	200		P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C24	470				D6-471	5R5T47	ED-470		MS-347	10%
C25	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C26	470				D6-471	5R5T47	ED-470		MS-347	10%
C27	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C28	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C29	270				D6-271	L10T27	ED-270		MS-327	10%
C30	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C31	.05	400		P488N-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C32	.05	400		P488N-05	DF-503	CUB4S5		GEM-415	4TM-S5	

Note 1. Some versions may use .01mfd in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	BELL SOUND PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	250K	½	B-20066164					Loudness, Tap ② 100K & 150K
B	Switch							
R2A	250K	½	B-20066P162	B-50	A47-250K-S	Q11-130	U46	Level
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	2meg	½	B-20066P159	B-76	A47-2meg-Z	Q13-139	U55	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS (cont)

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	BELL SOUND PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R4A	2meg	½	B-20066P159	B-76	A47-2meg-Z	Q13-139	U55	Treble
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R5A	100Ω	2	B-20066P141	WN-101	A43-100		C100P *	Hum (Wire Wound)
B	Shaft			Not Req.	FKS-1/4		Not Req.	

* Use #203 & #212 Fiber Insulating Washers.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		BELL SOUND PART No.	NOTES
	OHMS	WATT		
R6	47K			
R7	10K			
R8	180K			
R9	33K			
R10	390K			
R11	100K			
R12	680Ω			
R13	4.7meg			
R14	1meg			
R15	100K			
R16	100K			
R17	1.8meg			
R18	33K			
R19	220K			
R20	33K 5%			
R21	120K			
R22	39K			
R23	220K			
R24	27K			
R25	4.7meg			
R26	100K			
R27	2.2meg			
R28	27K			

ITEM No.	RATING		BELL SOUND PART No.	NOTES
	OHMS	WATT		
R29	27K			
R30	22K			
R31	220K			
R32	27K			
R33	100K			
R34	820Ω			
R35	100K			
R36	27K			
R37	27K			
R38	27K			
R39	470K 5%			
R40	4700Ω			
R41	100K			
R42	2.2meg			
R43	470K 5%			
R44	27K			
R45	6800Ω			
R46	470K 5%			
R47	470K 5%			
R48	470K 5%			
R49	275Ω	5		
R50	470K			
R51	6800Ω	7		

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	BELL SOUND PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ② .74A	740VCT ② .082A	5V ② 2A	B20368 ①	P9311 ②			PM8409 ②	24R04 ②	R-11B ②
	SEC. 3	SEC. 4	SEC. 5							
	6.3V ② 2.2A									

① Part #B20369 used for 50~ operation.

② Tap center tap on 6.3V winding.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	BELL SOUND PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	7600Ω CT	16Ω Tap ② 8Ω, 4Ω	32B8 ①							① Alternate Part #B20370

FUSES

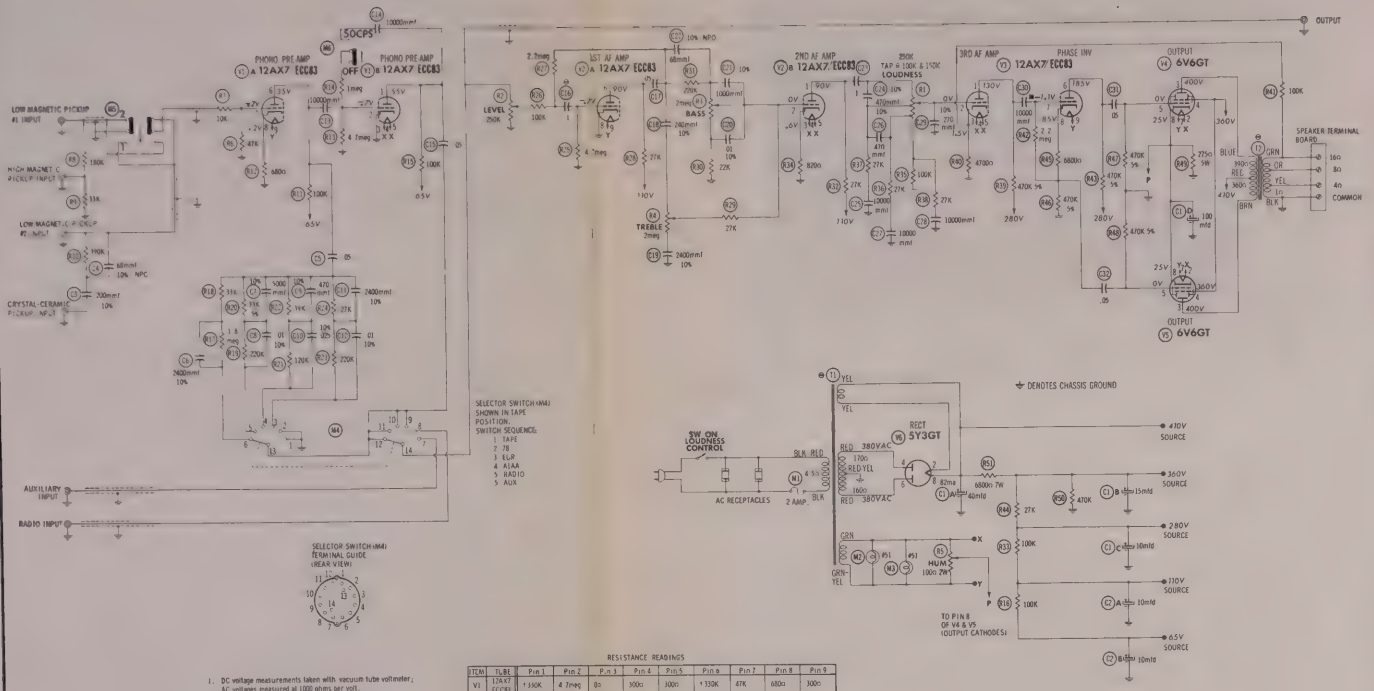
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			BELL SOUND PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	2A 250V			312002. (3AG 2A 250V)	342001	AGC2	HKP

MISCELLANEOUS

ITEM No.	PART NAME	BELL SOUND PART No.	NOTES
M2	Pilot Lamp		#51
M3	Pilot Lamp		#51
M4	Switch		Selector (Rotary Wafer Type)
M5	Switch		Input (Slide Type DPDT)
M6	Switch		Filter (Slide Type DPDT)

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7 ECC83	†150K	4.7meg	0Ω	300Ω	300Ω	†330K	47K	680Ω	300Ω
V2	12AX7 ECC83	†150K	27K	820Ω	300Ω	300Ω	†150K	4.7meg	0Ω	300Ω
V3	12AX7 ECC83	†500K	100K	4800Ω	300Ω	300Ω	†500K	2.7meg	470K	300Ω
V4	6V6GT	TP	300Ω	†390Ω	†6800Ω	470K	TP	300Ω	275Ω	
V5	6V6GT	TP	300Ω	†390Ω	†6800Ω	470K	NC	300Ω	275Ω	
V6	5Y3GT	NC	20K(Min)	NC	170Ω	NC	160Ω	NC	20K(Min)	

† MEASURED FROM PIN 8 OF V6
* MEASURED FROM PIN 8 OF V3
NC NO CONNECTION
TP TIE POINT

PHOTOFACT* Folder

*TRADE MARK

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

DAVID BOGEN
MODEL LX60

DAVID BOGEN
MODEL LX60

DAVID BOGEN
MODEL LX60

TRADE NAME	David Bogen Model LX60		
MANUFACTURER	David Bogen Co., Inc., P. O. Box 500, Paramus, N. J.		
TYPE SET	AC Operated 7 Channel 60 Watt Audio Amplifier		
TUBES	Thirteen		
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING	1.2 Amp. @ 117 Volts AC (135 Watts)

VOLTAGE REGULATOR ADJUSTMENT (R8)

The voltage regulator control (R8) should be adjusted if V6, V7, V8, V9 or V10 is replaced. Turn Volt Reg. control (R8) and all volume controls (R1, R2, R3, R4) to minimum. Allow the amplifier to warm up for four minutes. Connect the negative lead of an accurate low range DC voltmeter to chassis; connect the positive lead to pin 3 (cathode) of one of the output tubes (V6, V7, V8, V9). Turn the Volt Reg. control (R8) for a SLIGHT meter reading. Measure the voltage at pin 3 of each of the output tubes. Keep the meter connected to that pin which measures the highest voltage. Adjust the Volt Reg. control (R8) for a meter reading of .25 volts.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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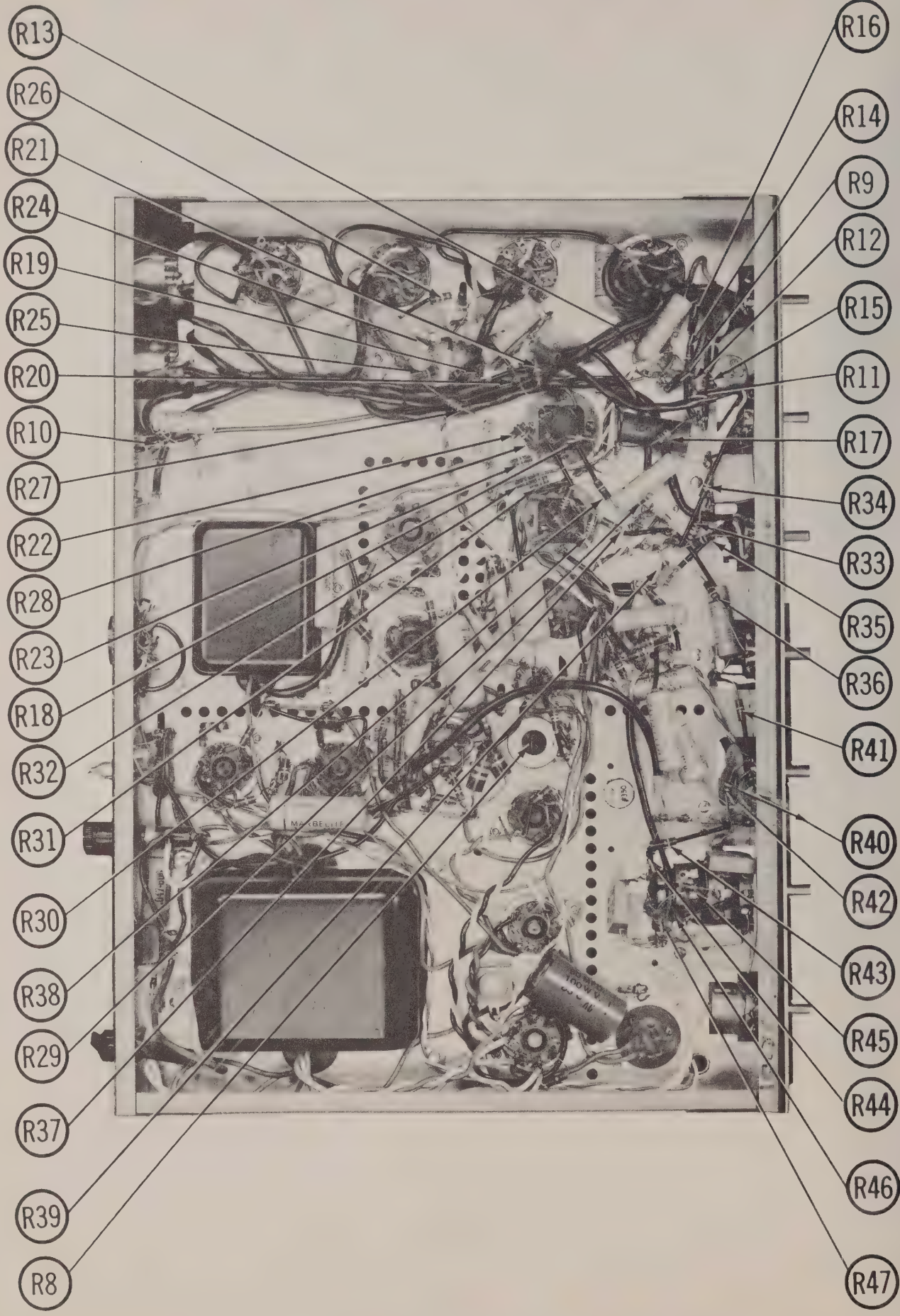
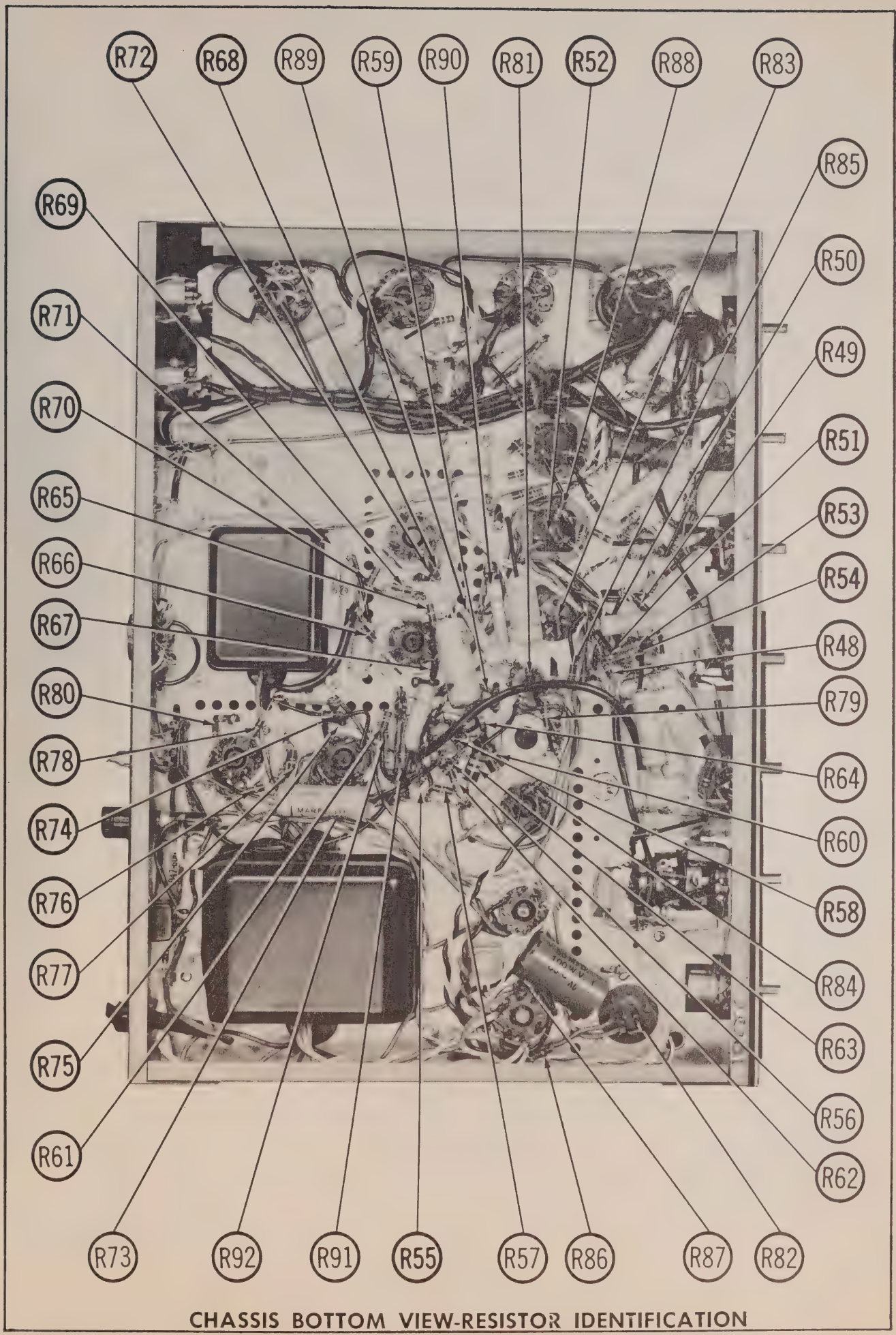
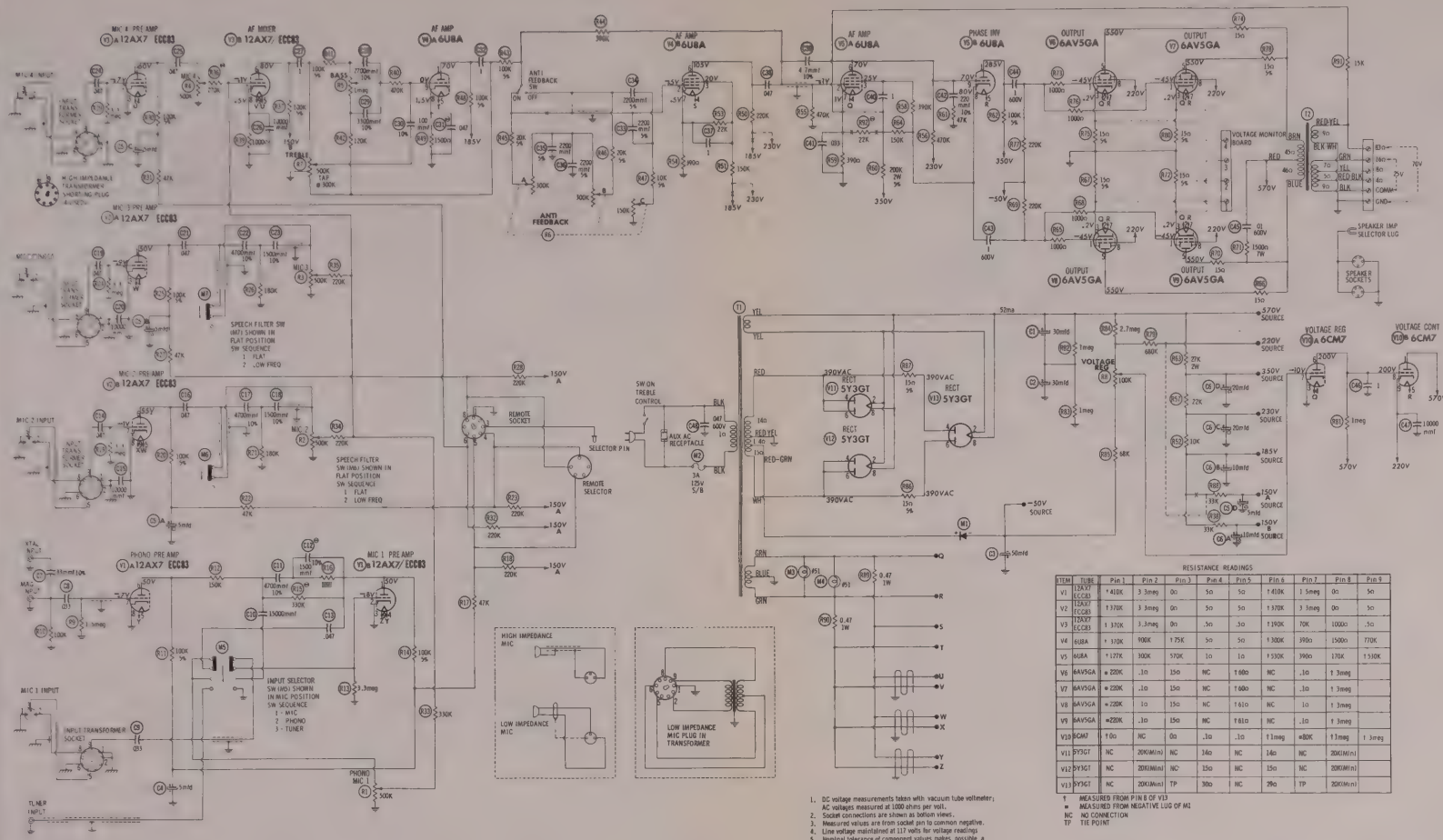


CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7 ECC83	†410K	3.3meg	0Ω	5Ω	5Ω	†410K	1.5meg	0Ω	5Ω
V2	12AX7 ECC83	†370K	3.3meg	0Ω	5Ω	5Ω	†370K	3.3meg	0Ω	5Ω
V3	12AX7 ECC83	†370K	3.3meg	0Ω	5Ω	.5Ω	†190K	70K	1000Ω	.5Ω
V4	6U8A	†320K	900K	†75K	5Ω	5Ω	†300K	390Ω	1500Ω	770K
V5	6U8A	†127K	300K	570K	1Ω	1Ω	†530K	390Ω	170K	†530K
V6	6AV5GA	∞220K	.1Ω	15Ω	NC	†68Ω	NC	.1Ω	†3meg	
V7	6AV5GA	∞220K	.1Ω	15Ω	NC	†68Ω	NC	.1Ω	†3meg	
V8	6AV5GA	∞220K	1Ω	15Ω	NC	†61Ω	NC	1Ω	†3meg	
V9	6AV5GA	∞220K	.1Ω	15Ω	NC	†61Ω	NC	.1Ω	†3meg	
V10	6CM7	†0Ω	NC	0Ω	.1Ω	.1Ω	†1meg	∞80K	†1meg	†3meg
V11	5Y3GT	NC	20K(Min)	NC	14Ω	NC	14Ω	NC	20K(Min)	
V12	5Y3GT	NC	20K(Min)	NC	15Ω	NC	15Ω	NC	20K(Min)	
V13	5Y3GT	NC	20K(Min)	TP	30Ω	NC	39Ω	TP	20K(Min)	

† MEASURED FROM PIN 8 OF V13
∞ MEASURED FROM NEGATIVE LUG OF M1
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings
6. All controls at minimum, proper output load connected

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

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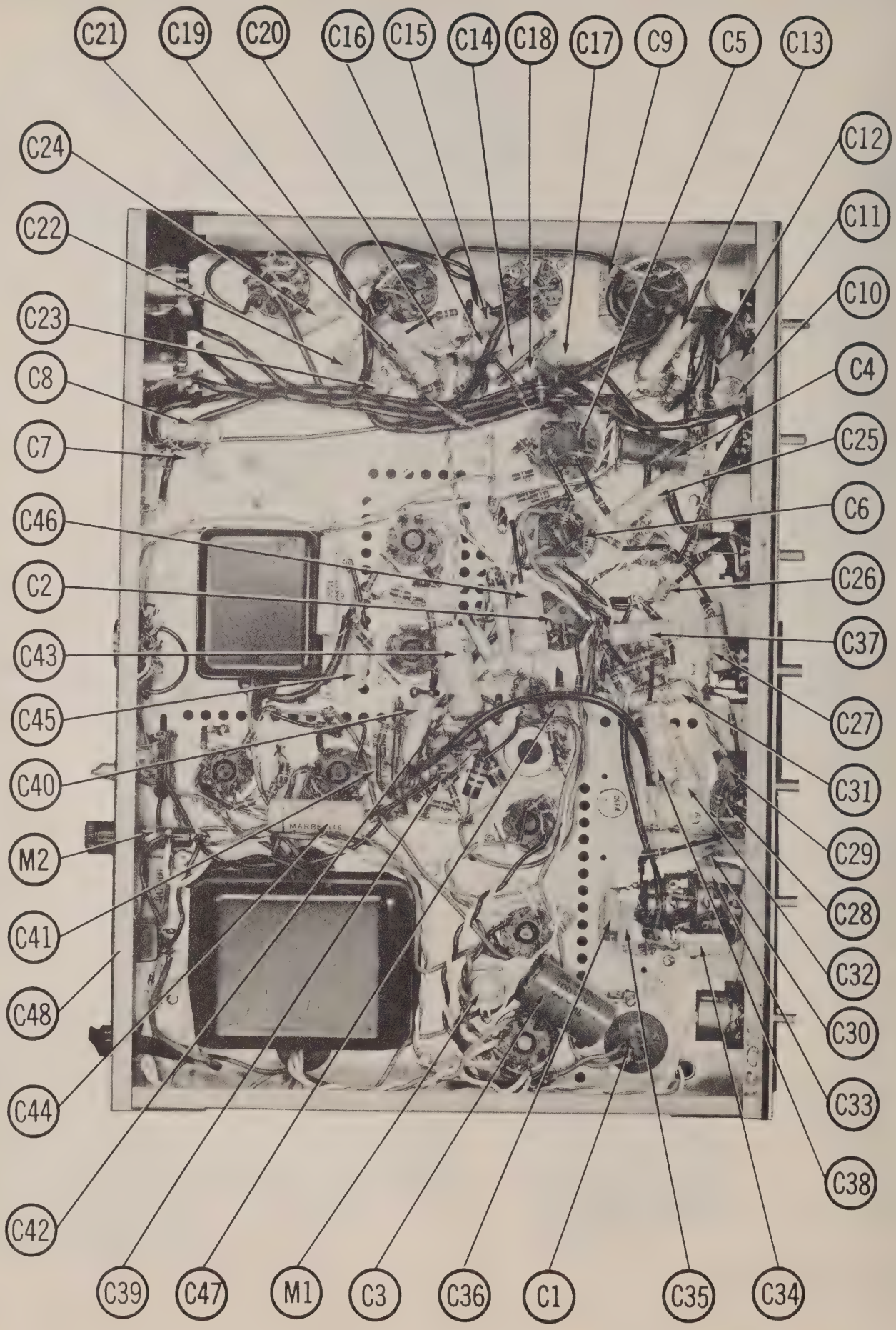


CHASSIS BOTTOM VIEW - CAPACITOR & MISCELLANEOUS IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	Phono-Mic 1 Preamp.	12AX7/ECC83
V2	Mic 2-3 Preamp.	12AX7/ECC83
V3	Mic 4 Preamp.-AF Mixer	12AX7/ECC83
V4	AF Amplifier	6U8A
V5	AF Amp.-Phase Inv.	6U8A
V6	Output	6AV5GA
V7	Output	6AV5GA

ITEM No.	USE	TYPE
V8	Output	6AV5GA
V9	Output	6AV5GA
V10	Volt. Reg.-Volt. Cont.	6CM7
V11	Rectifier	5Y3GT
V12	Rectifier	5Y3GT
V13	Rectifier	5Y3GT

ELECTROLYTIC CAPACITORS

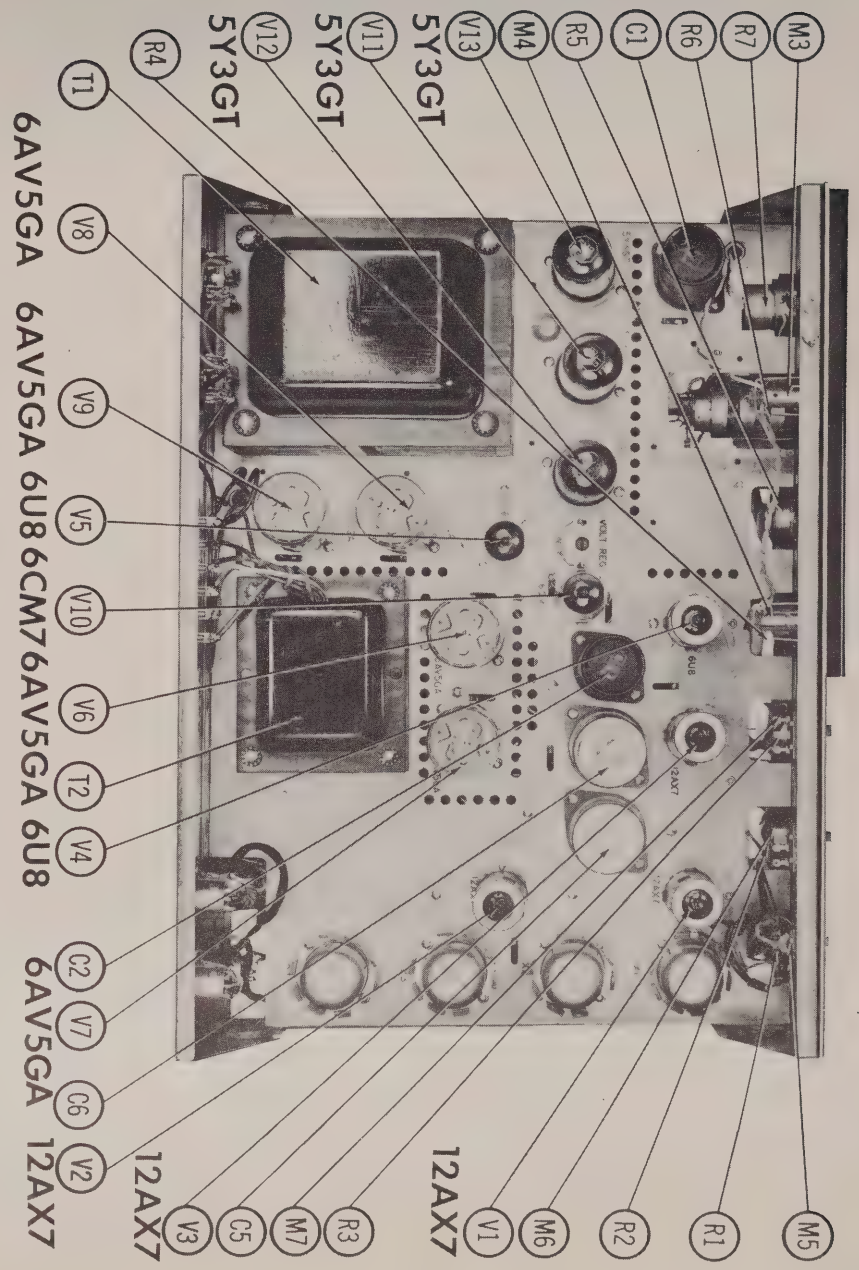
ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA David Bogen PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	30	400		AFH1-51	A0470	FP145	TMS-56	S-265	TVL-1720
C2	30	400		AFH1-51	A0470	FP145	TMS-56	S-265	TVL-1720
C3	50	100		PRS150V50	BR5015	TC49	TD-50-150	MT-1550	TVA-1414
C4	5	200		PRS250V4	BBR4-250	TC50X	TD-4-250	MT-4504	TVA-1501
C5A	■5	200		AFH4-09	D0080	WP433.6	TMQ-9	Q-027	TVL-4759.7
B	▲5	200							
C	5	200							
D	▰5	200							
C6A	▲10	350		AFH4-19-10	D0179.3	FP474.5	TMQ-113	Q-035 MT-4510	TVL-4826
B	10	350							
C	■20	450							
D	▰20	450							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA David Bogen PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C7	33			NPO-DI 33	DD-330	L10Q33	ED-33	ZT-5433	5TCC-Q33	10%
C8	.033	200		P288N-033	DF-303	CUB6S33		GEM-4133	6TM-S33	
C9	.033	200		P288N-033	DF-303	CUB6S33		GEM-4133	6TM-S33	
C10	15000			BPD-015	DD16-153	BYA10S15	ED-015		5HK-S15	
C11	4700					1R5D47	CY20C472K		MS-247	10%
C12	1500					1R5D15	ED-1500	MCB456	MS-215	10% ①
C13	.047	200		P288N-047	DF-503	CUB2S47		GEM-4147	2TM-S47	
C14	.047	200		P288N-047	DF-503	CUB2S47		GEM-4147	2TM-S47	
C15	10000			BPD-01	BPD-01	BYA6S1	ED-01	DC511	5HK-S1	
C16	.047	200		P288N-047	DF-503	CUB2S47		GEM-4147	2TM-S47	
C17	4700					1R5D47	CY20C472K		MS-247	10%
C18	1500					1R5D15	ED-1500	MCB456	MS-215	10%
C19	.047	200		P288N-047	DF-503	CUB2S47		GEM-4147	2TM-S47	
C20	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C21	.047	200		P288N-047	DF-503	CUB2S47		GEM-4147	2TM-S47	
C22	4700					1R5D47	CY20C472K		MS-247	10%
C23	1500					1R5D15	ED-1500	MCB456	MS-215	10%
C24	.047	200		P288N-047	DF-503	CUB2S47		GEM-4147	2TM-S47	
C25	.047	200		P288N-047	DF-503	CUB2S47		GEM-4147	2TM-S47	
C26	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C27	.1	200		P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C28	2700					1R5D27	CY20C272K		MS-227	10%
C29	3300					1R5D33	CY20C332K		MS-233	10%
C30	100			NPO-DI 100	DD-101	L10T1	ED-100	ZT-531	5TCC-T1	10%
C31	.047	200		P288N-047	DF-503	CUB2S47		GEM-4147	2TM-S47	②
C32	.1	400		P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C33	2200			1464-0022		1R5D22	CY20C222J		MS-222	5%
C34	2200			1464-0022		1R5D22	CY20C222J		MS-222	5%
C35	2200			1464-0022		1R5D22	CY20C222J		MS-222	5%
C36	2200			1464-0022		1R5D22	CY20C222J		MS-222	5%
C37	.1	200		P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C38	.047	400		P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	
C39	4.7			NPO-DI 4.7	TCZ-4R7	C10V47C	TCO-4.7	ZT-5547	5TCCB-V47	10%
C40	.1	200		P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C41	.033	200		P288N-033	DF-303	CUB6S33		GEM-4133	6TM-S33	
C42	220			NPO-SI 220	D6-221	L10T22	ED-220		MS-322	10%

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	David Bogen PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C43	.1	600		P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C44	.1	600		P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C45	.01	600		P688N-01	D6-103	CUB6S1		GEM-611	6TM-S1	
C46	.1	400		P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C47	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C48	.047	600		P688N-047	DF-503	CUB6S47		GEM-6147	6TM-S47	

① Some versions may use 2200mmf in this application.
② Some versions may use .022mfd in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	David Bogen PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	V367	B-60	A47-500K-Z	Q13-133	U48	Input
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R2A	500K	½	V367	B-60	A47-500K-Z	Q13-133	U48	Mic 2
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	500K	½	V367	B-60	A47-500K-Z	Q13-133	U48	Mic 3
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4A	500K	½	V367	B-60	A47-500K-Z	Q13-133	U48	Mic 4
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R5A	1meg	½	V376	B-69	A47-1meg-S	Q13-137	U54	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R6A	300K	½	V396A					Anti-Feedback
B	300K	½						
C	150K	½						
D	Switch							
R7A	500K	½	V406	BT-64	A47F5-500K	Q19-133X	UT-431	Treble, Tap ② 300K
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KB-1	SWE-1	76-1	US-26	Power On-Off
R8A	100K	½	V392A	AB-40	A47-100K-S	B11-128	TA15L	Volt. Reg.
B	Shaft			AK-1	FKS-1/4	TM1-Kit	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	David Bogen PART No.	NOTES
R9	1.5meg			
R10	100K			
R11	100K 5%			
R12	150K			
R13	3.3meg			
R14	100K 5%			
R15	330K			Note 1
R16	68K			
R17	47K			
R18	220K			
R19	3.3meg			
R20	100K 5%			
R21	180K			
R22	47K			
R23	220K			
R24	3.3meg			
R25	100K 5%			
R26	180K			
R27	47K			
R28	220K			
R29	3.3meg			
R30	100K 5%			
R31	47K			
R32	220K			
R33	330K			
R34	220K			
R35	220K			
R36	270K			Note 2
R37	100K 5%			
R38	33K			
R39	1000Ω			
R40	470K			
R41	100K 5%			
R42	120K			
R43	100K 5%			
R44	390K			
R45	20K 5%			
R46	20K 5%			
R47	10K 5%			
R48	100K 5%			
R49	1500Ω			
R50	220K			
R51	150K			
R52	10K			
R53	22K			
R54	390Ω			
R55	470K			
R56	470K			
R57	22K			
R58	390K			
R59	390Ω			
R60	200K 5%	2		
R61	47K			
R62	100K 5%			
R63	27K	2		
R64	150K			
R65	1000Ω			
R66	15Ω			
R67	15Ω 5%			
R68	1000Ω			
R69	220K			
R70	15Ω			
R71	1500Ω	7		
R72	15Ω 5%			
R73	1000Ω			
R74	15Ω			

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	David Bogen PART No.	NOTES
R75	15Ω 5%			
R76	1000Ω			
R77	220K			
R78	15Ω 5%			
R79	680K			
R80	15Ω 5%			
R81	1meg			
R82	1meg			
R83	1meg			
R84	2.7meg			
R85	68K			
R86	15Ω 5%			
R87	15Ω 5%			
R88	33K			
R89	0.47	1		
R90	0.47	1		
R91	15K			
R92	22K			Note 3

Note 1. Some versions may use 680K in this application.
Note 2. Some versions may use 220K in this application.
Note 3. Not used in some versions.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	David Bogen PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ② 1.2A	870VCT ② .052A Tap ② 37V ② .001A	5V ② 6A	T3150						
	SEC. 3 6.3VCT ② 7A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.1	David Bogen PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	3300Ω CT	83Ω (70V) SEC.2 16Ω Tap ② 8Ω, 4Ω	T2124							

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT (Measured)	David Bogen PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1	.001A	H373	1263A	RS065Q	10	

FUSES

ITEM No.	TYPE	RATING	David Bogen PART No. FUSE	David Bogen PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2	3AG	3A 125V S/B			313003. (3AG 3A 125V Slo Blo)	342001	MDX3	HKP

MISCELLANEOUS

ITEM No.	PART NAME	David Bogen PART No.	NOTES
M3	Pilot Lamp		#51
M4	Pilot Lamp		#51
M5	Switch	S475	Phono-Tuner (Slide Type DPDT)
M6	Switch	S381	Speech Filter (Slide Type DPST)
M7	Switch	S381	Speech Filter (Slide Type DPST)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT* Folder

*TRADE MARK

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

LAFAYETTE MODEL LA-69

LAFAYETTE
MODEL LA-69

LAFAYETTE
MODEL LA-69

TRADE NAME	Lafayette Model LA-69
SUPPLIER	Lafayette Radio, 165-08 Liberty Ave., Jamaica 33, N. Y.
TYPE SET	AC Operated 6 Channel Audio Amplifier
TUBES (Six)	Types 12AX7/ECC83 Phono Preamplifier, 12AX7/ECC83 AF Amplifier, 6AN8 AF Amp.-Phase Inv., (2) 6BQ5/EL84 Output, 6CA4/EZ81 Rectifier
POWER SUPPLY	110-120 Volts AC-50/60 Cycles RATING .62 Amp. @ 117 Volts AC (60 Watts)

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America

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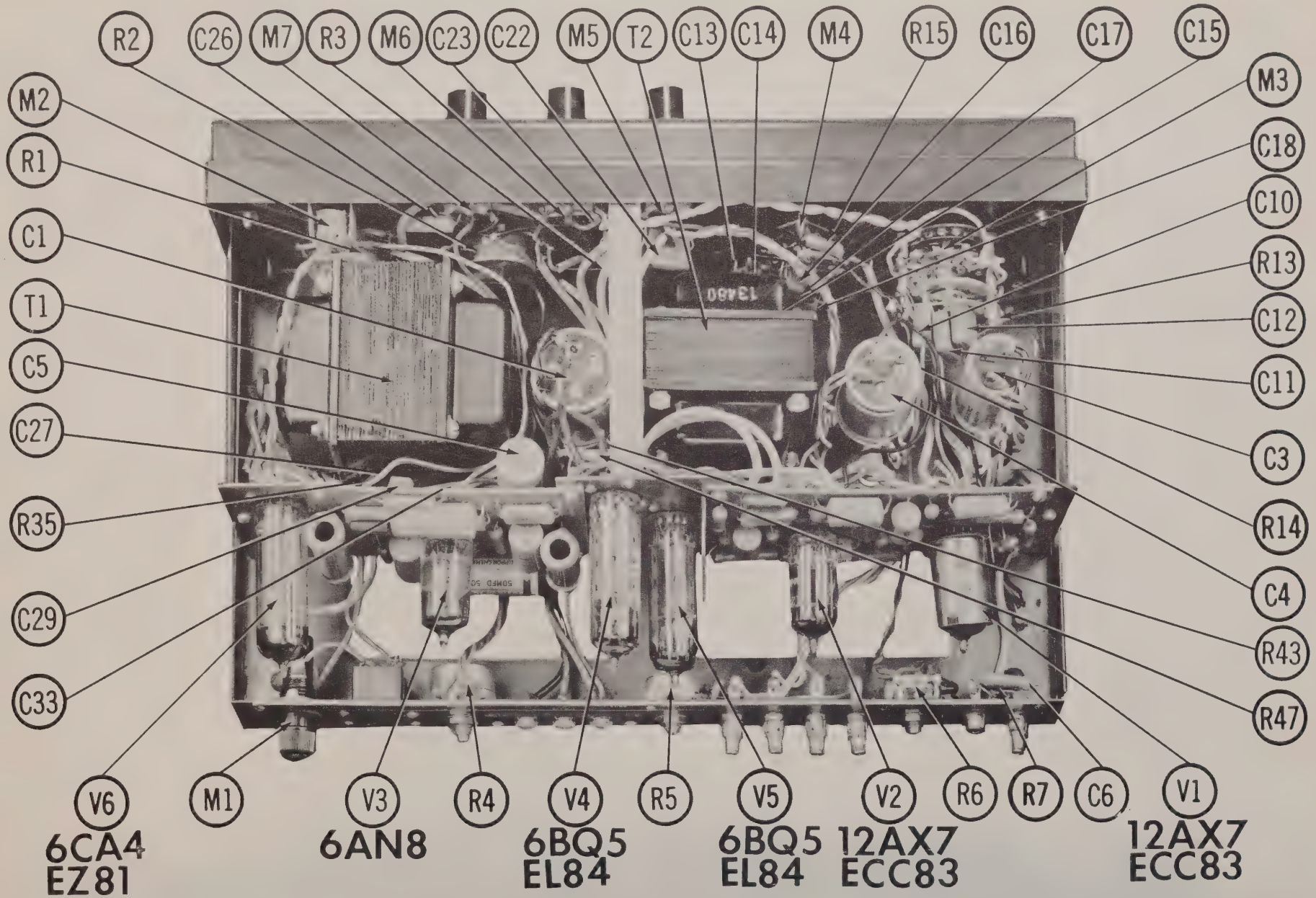


CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	Phono Preamplifier	12AX7/ECC83
V2	AF Amplifier	12AX7/ECC83
V3	AF Amp. - Phase Inv.	6AN8
V4	Output	6BQ5/EL84
V5	Output	6BQ5/EL84
V6	Rectifier	6CA4/EZ81

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA LAFAYETTE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	20	450	①	AFH3-35	C0260	FP376.3	TMQ-10	T-135	TVL-3780
B	10	450	①						
C	10	450	①						
C2	50	50		PRS50V50	BR505	TC39	TD-50-50	MT-0550	TVA-1308
C3A	■10	350		AFH3-106	C0780	FP330.7	TMT-91	T-465	R2587*
B	▬20	350							
C	▲25	25							
C4A	10	350	②	AFH3-35	C0260	FP376.3	TMQ-10	T-135	TVL-3779
B	10	350	②						
C	20	350							
C5	10	350	③	PRS350V10	BR1045	TC62	TD-10-450	MT-4510	TVA-1604

① In some versions C1 may be a 40mfd unit
② In some versions C4A and C4B are combined in one 20mfd section.
③ Not used in some versions.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

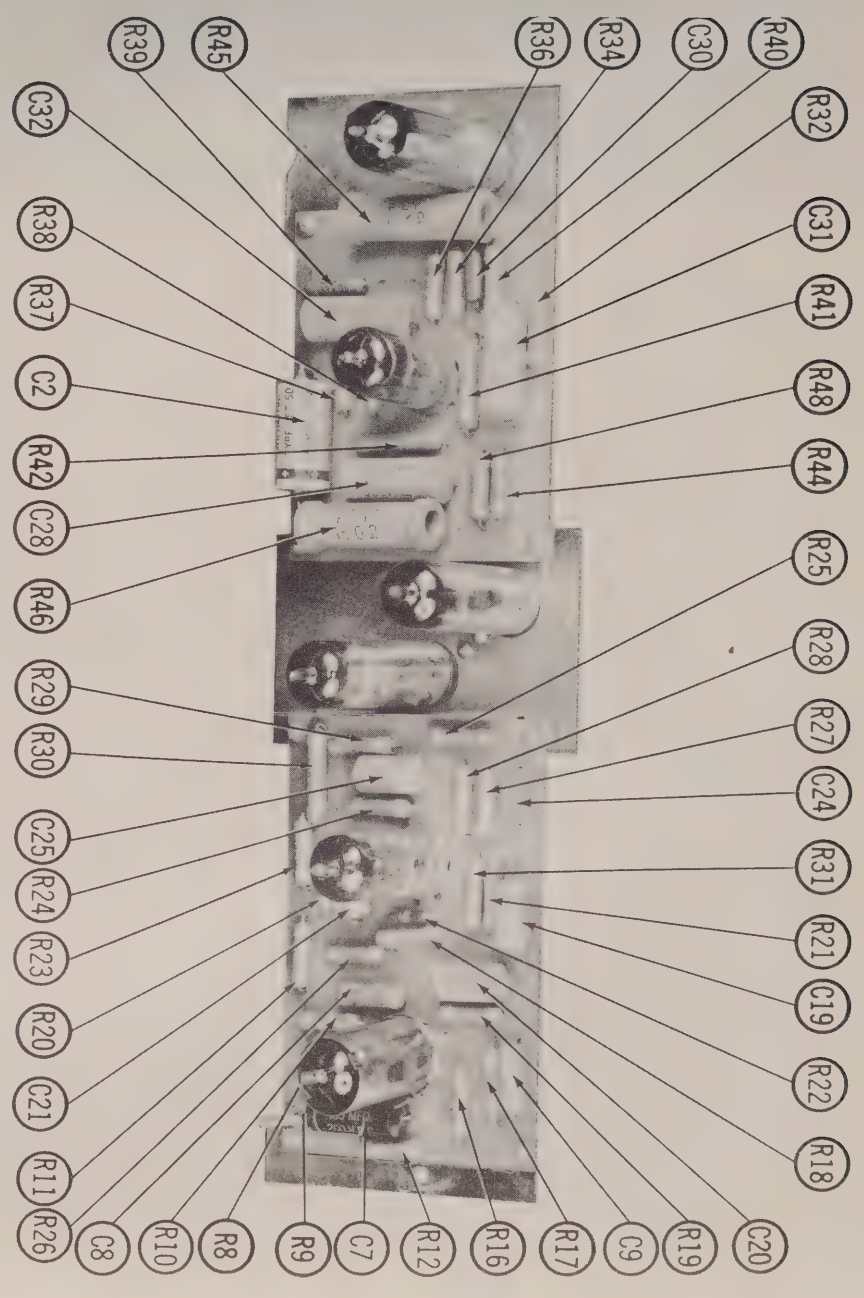
ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA LAFAYETTE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C6	220			1468-00022	D6-221	5W5T22	ED-220	UC-5322	1FM-322	
C7	.05	200		P288N-05	DF-503	CUB2S5		GEM-415	2TM-S5	①
C8	.01	600		P688N-01	D6-103	CUB6S1	GP-10000	GEM-611	6TM-S1	
C9	.02	600		P688N-02	DD-203	CUB6S2	ED-02	GEM-612	6TM-S2	
C10	2000			1464-002		1R5D2	CY20C202K	MCB457	MS-22	10%
C11	1000			1464-001		1R5D1	ED-1000	MCB255	MS-21	10%
C12	1000			1464-001		1R5D1	ED-1000	MCB255	MS-21	10%
C13	330			1469-00033	D6-331	5R5T33	ED-330		MS-333	10%
C14	330			1469-00033	D6-331	5R5T33	ED-330		MS-333	10%
C15	220			1469-00022	D6-221	5R5T22	ED-220		MS-322	10%
C16	220			1469-00022	D6-221	5R5T22	ED-220		MS-322	10% ②
C17	220			1469-00022	D6-221	5R5T22	ED-220		MS-322	10%
C18	50			1469-00005	D6-500	22R5Q5	ED-50	MCB225	MS-45	10%
C19	.05	400		P488N-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C20	.05	400		P488N-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C21	.05	600		P688N-05	DF-503	CUB6S5		GEM-615	6TM-S5	
C22	5000			1464-005		1R5D5		MCB465	MS-25	10%
C23	5000			1464-005		1R5D5		MCB465	MS-25	10%
C24	100			1469-0001	D6-101	5R5T1	ED-100	MCB235	MS-31	10%
C25	.05	600		P688N-05	DF-503	CUB6S5		GEM-615	6TM-S5	
C26	.01	400		P488N-01	D6-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C27	.02	600		P688N-02	DD-203	CUB6S2	ED-02	GEM-612	6TM-S2	
C28	.1	600		P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C29	150			1468-00015	D6-151	5W5T15	ED-150	UC-5315	1FM-315	
C30	50			1468-00005	D6-500	5W5Q5	ED-50	UC-545	1FM-45	
C31	.1	600		P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C32	.1	600		P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	

① Some versions may use .01mfd in this application.
② Some versions may use 280mmf in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA LAFAYETTE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½						Volume-Loudness, Tap ②
B	Switch							Power-On-Off 50K
R2	500K	½						Treble, Tap ② 200K
R3	1meg	½						Bass

CHASSIS–PRINTED BOARD



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS (cont)

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	LAFAYETTE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R4A	500Ω	2		WN-501	A43-100	WPS500	R500L	Hum Balance (Wire wound)
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	
R5A	250K	½		AB-50	A47-250K-S	Q11-130	U46	Radio Level
B	Shaft			AK-1	FKS-1/4	RQ	Not Req.	
R6A	250K	½		AB-50	A47-250K-S	Q11-130	U46	Phono Level
B	Shaft			AK-1	FKS-1/4	RQ	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		LAFAYETTE PART No.	NOTES
	OHMS	WATT		
R7	47K			Note 1
R8	27K			
R9	1meg			
R10	100K			
R11	100K			
R12	3300Ω			
R13	2.7meg			
R14	1meg			
R15	100K			
R16	1meg			
R17	62K			
R18	47K			
R19	1600Ω			
R20	47K			
R21	100K			
R22	270K			
R23	47K			
R24	1600Ω			
R25	100K			
R26	100K			
R27	470K			

ITEM No.	RATING		LAFAYETTE PART No.	NOTES
	OHMS	WATT		
R28	1000Ω			
R29	47K			
R30	22K	1		
R31	1600Ω			
R32	15K			
R33	250K			
R34	600K			
R35	10K	1		Note 2
R36	2.7meg			
R37	600Ω			
R38	600Ω			
R39	33K			
R40	62K			
R41	47K	1		
R42	47K	1		
R43	1000Ω			
R44	100K			
R45	1000Ω	3		
R46	150Ω	3		
R47	1000Ω			
R48	100K			

Note 1. Some versions may use 27K in this application.
Note 2. Not used in some versions.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	LAFAYETTE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .62A	560VCT @ .080A	6.3V @ 1.1A							
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 2.5A									

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	LAFAYETTE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6700Ω CT	16Ω tap @ 8Ω		Z1405			A-3307	22S68	S-60A	

FUSES

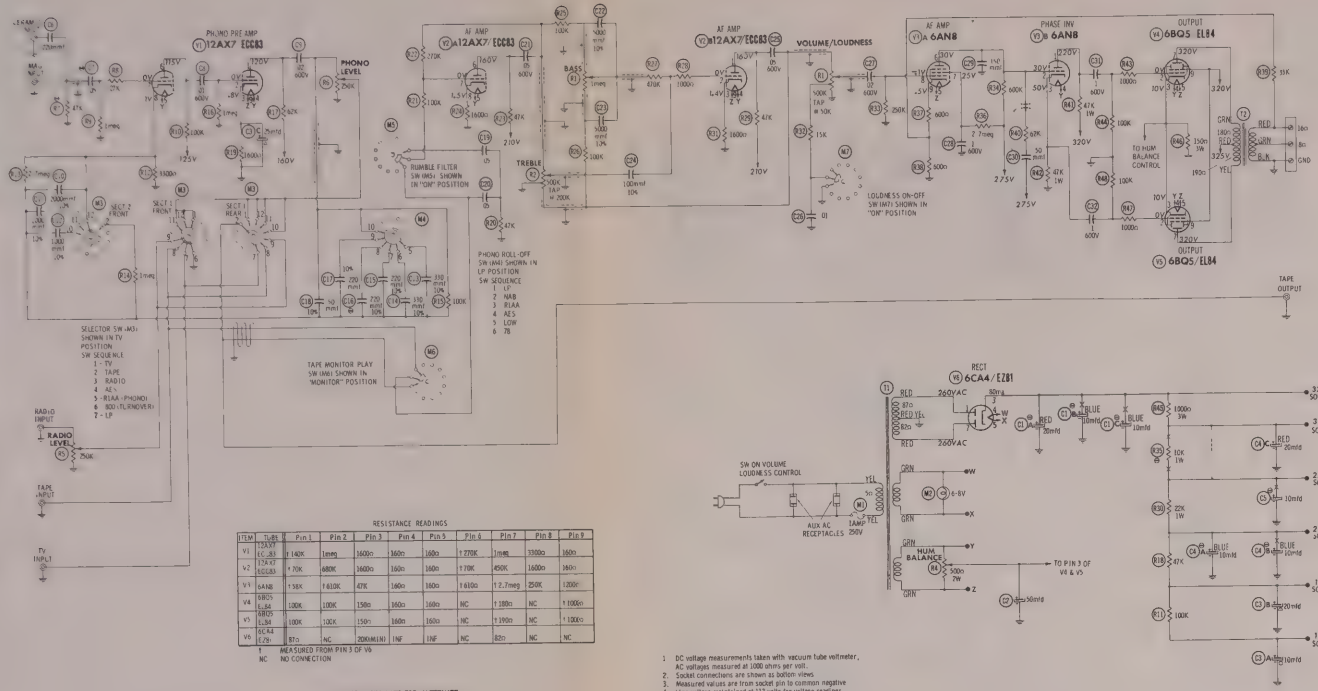
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			LAFAYETTE PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	1A			312001. (3AG 1A 250V)	342001	AGC 1	HKP

MISCELLANEOUS

ITEM No.	PART NAME	LAFAYETTE PART No.	NOTES
M2	Pilot Lamp		6-8V
M3	Switch		Selector, Rotary, wafer type
M4	Switch		Roll-off, Rotary wafer type
M5	Switch		Rumble-Filter, wafer type
M6	Switch		Tape, wafer type
M7	Switch		Loudness, wafer type

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7 ECC83	140K	1meg	1600Ω	160Ω	160Ω	270K	1meg	3300Ω	160Ω
V2	12AX7 ECC83	70K	680K	1600Ω	160Ω	160Ω	70K	450K	1600Ω	160Ω
V3	6AN8	38K	610K	47K	160Ω	160Ω	610Ω	12.7meg	250K	1200K
V4	6BQ5 EL84	100K	100K	150Ω	160Ω	160Ω	NC	180Ω	NC	1000Ω
V5	6BQ5 EL84	100K	100K	150Ω	160Ω	160Ω	NC	190Ω	NC	1000Ω
V6	6CA4 EZ81	82Ω	NC	200MIN	INF	INF	NC	82Ω	NC	NC

1 MEASURED FROM PIN 3 OF V6
NC NO CONNECTION

⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

PHOTOFACT* Folder

*TRADE MARK

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

PACEMAKER MODEL PM20

PACEMAKER MODEL PM20

TRADE NAME	Pacemaker Model PM 20
MANUFACTURER	Bell Sound Systems Inc., 555 Marion Road, Columbus 7, Ohio
TYPE SET	AC Operated 3 Channel 20 Watt Audio Amplifier
TUBES (Six)	Types 6AV6 Mic Preamplifier, 6AV6 AF Amplifier, 12AX7 AF Amp.-Phase Inv., (2) 6V6GT Output, 6AX5GT Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING .77 Amp. @ 117 Volts AC (78 Watts)

PACEMAKER MODEL PM20

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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H404

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Mic Preamplifier	6AV6	
V2	AF Amplifier	6AV6	
V3	AF Amp. -Phase Inv.	12AX7	

ITEM No.	USE	TYPE	NOTES
V4	Output	6V6GT	
V5	Output	6V6GT	
V6	Rectifier	6AX5GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Bell Sound PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	20	450		PR3-055	BBRT11145	WT700	TDLD-28	T-700	R2580 *
B	10	450			BR1005		TD-100-50	MT-0550	
C	100	50							
C2A	10	450		PRS450V1010	BBRT11145	TCD72	TDLD-26	FMD-4510	TVA-2722
B	10	450							
C3	150	15		PRS50V150	BR1505	TC1502	TD-150-50	S055	R2588 *

* Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Bell Sound PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C5	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C6	.05	400		P488N-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C7	470			1464-00047	D6-471	5R5T47	ED-470		MS-347	10%
C8	.005	400						GEM-1625		10%
C9	.003	400						GEM-1623		10%
C10	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C11	.05	400		P488N-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C12	.05	400		P488N-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C13	.001	1600		P1688N-001	DD16-102	CUB16D1		GEM-1621	MB-D1	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Bell Sound PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	B20066P140	B-70	A47-1meg-Z	QI3-137	U53	Mic
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R2A	1meg	½	B20066P140	B-70	A47-1meg-Z	QI3-137	U53	Phono
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	100Ω	2	B20066P141	WN-101	A43-100	WPK-100	R100L	Hum Balance -Wire wound
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	

RESISTORS

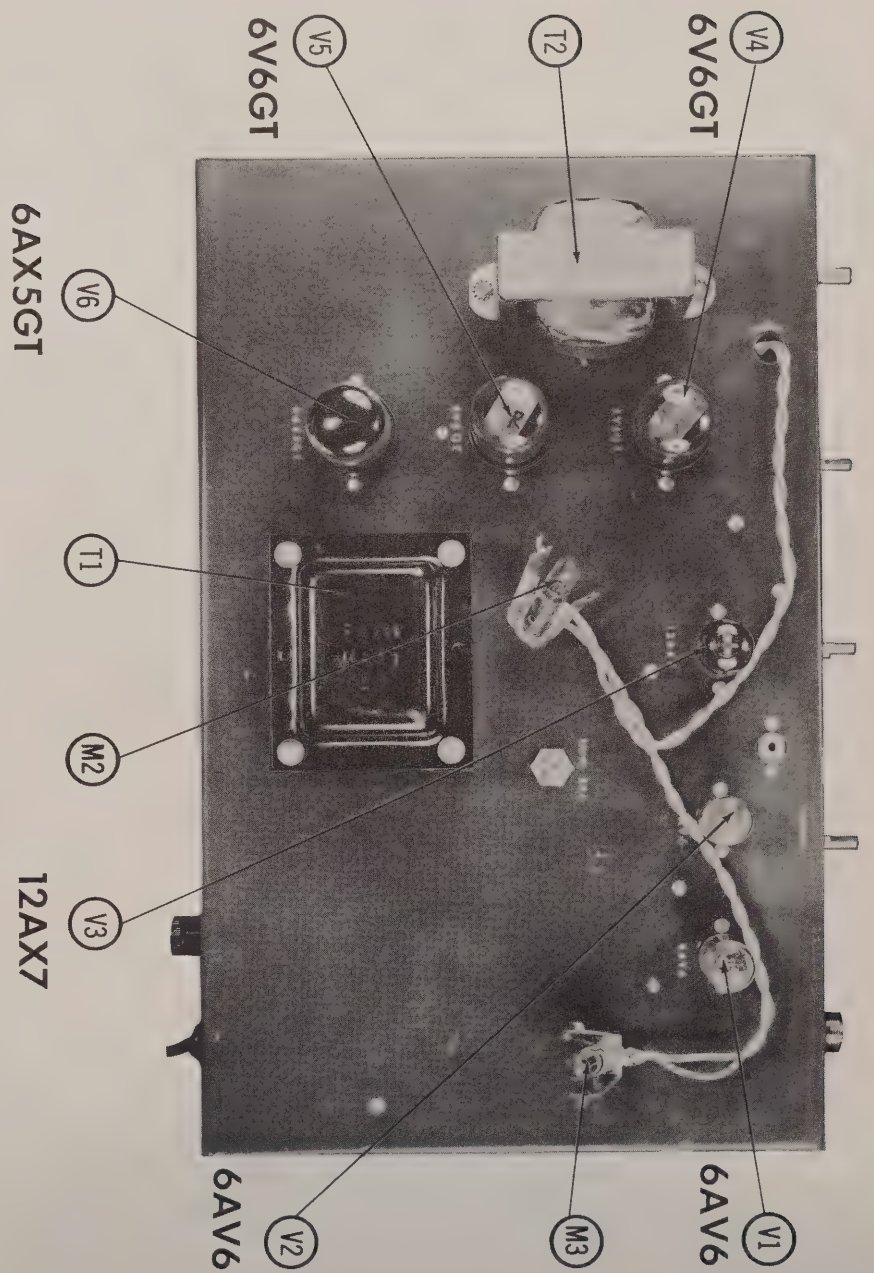
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	Bell Sound PART No.	NOTES
R4	4.7meg			
R5	100K			
R6	270K			
R7	270K			
R8	270K			
R9	47K			
R10	3300Ω			
R11	68K			
R12	150K			
R13	470K			
R14	47K			
R15	47K			
R16	1meg			
R17	270K			
R18	470K			

ITEM No.	RATING OHMS	RATING WATT	Bell Sound PART No.	NOTES
R19	6800Ω 5%			
R20	910K 5%			
R21	2200Ω			
R22	1meg			
R23	220K			
R24	47K			
R25	3300Ω			
R26	220K			
R27	270K			
R28	250Ω	4		
R29	270K			
R30	1500Ω	1		Note 1
R31	1500Ω	1		Note 2
R32	470K			

Note 1. Some versions may use 2700Ω 2W in this application.
Note 2. Not used in some versions.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	Bell Sound PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .77A	750VCT @ .090A	6.3V @ 3.6A	B-20297		P-2952		PM8409	24R04	R-11B

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Bell Sound PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5700Ω	70V tap @ 16Ω, 8Ω, 4Ω	B-20295		A-3028①					① Use 250Ω tap as 70V tap.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Bell Sound PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	2A 125V S/B			313002. (3AG-2A-125V-S/B)	342001	MDL2	HKP

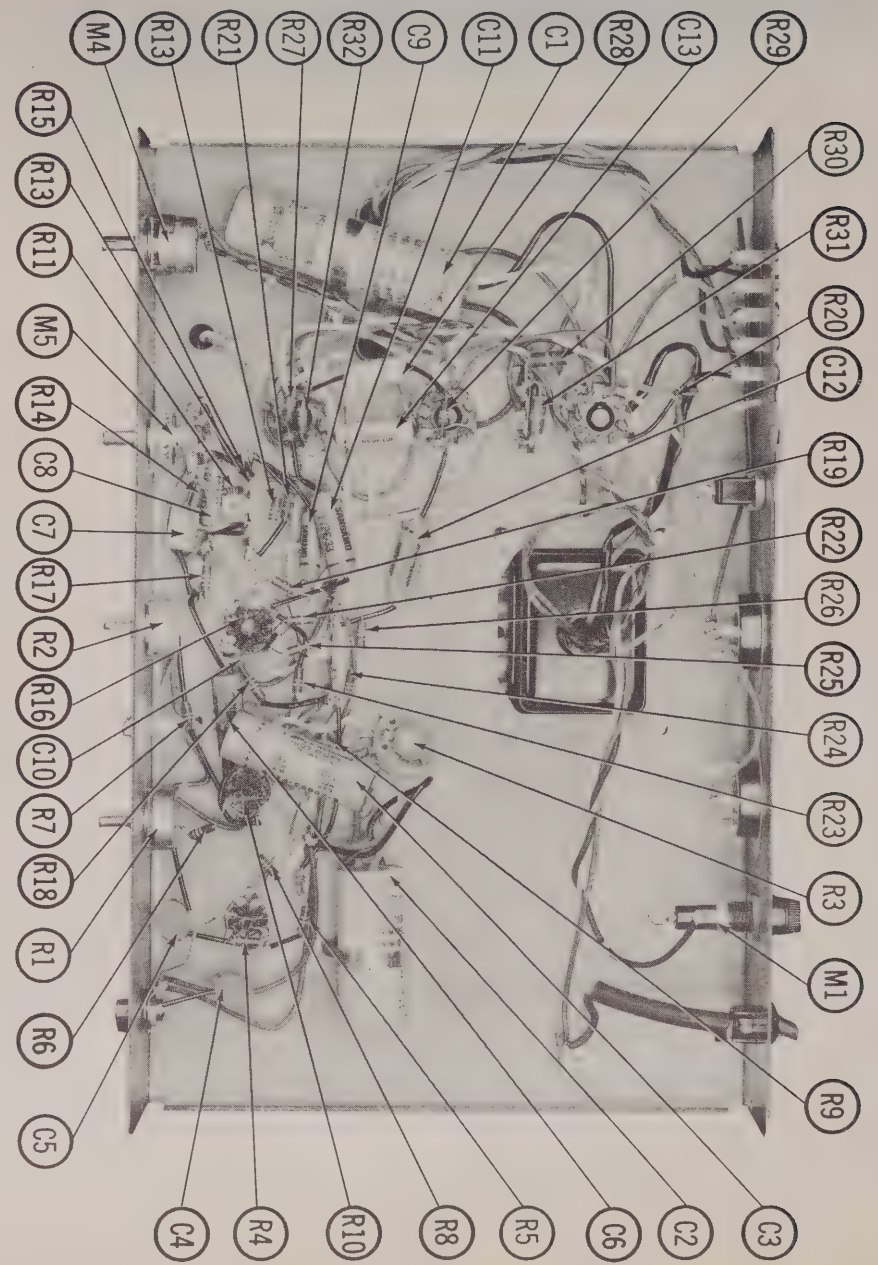
MISCELLANEOUS

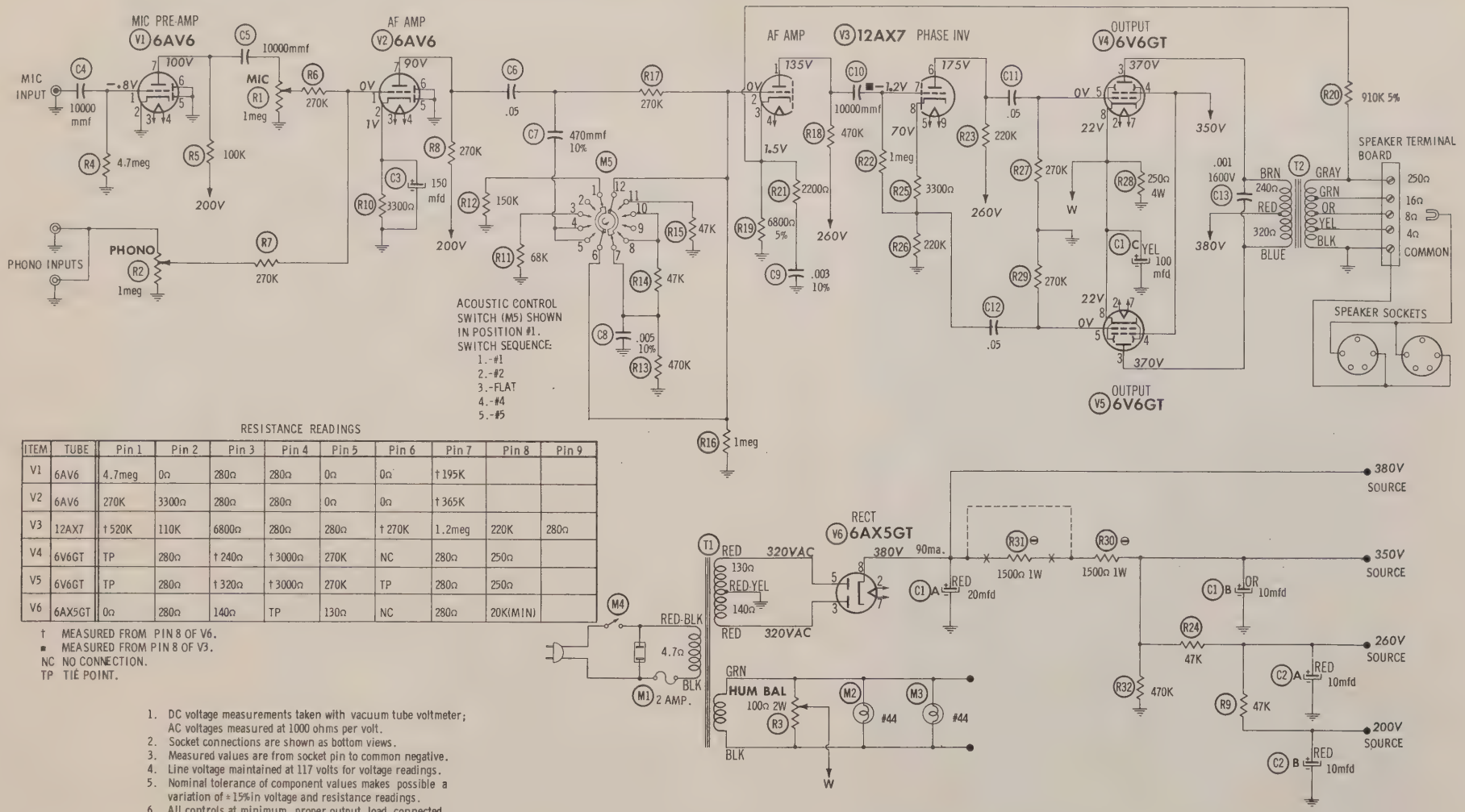
ITEM No.	PART NAME	Bell Sound PART No.	NOTES
M2	Pilot Lamp		#44
M3	Pilot Lamp		#44
M4	Switch		Power On-Off (SPST)
M5	Switch		Acoustic Control (Rotary wafer type)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AV6	4.7meg	0Ω	280Ω	280Ω	0Ω	0Ω	†195K		
V2	6AV6	270K	3300Ω	280Ω	280Ω	0Ω	0Ω	†365K		
V3	12AX7	†520K	110K	6800Ω	280Ω	280Ω	†270K	1.2meg	220K	280Ω
V4	6V6GT	TP	280Ω	†240Ω	†3000Ω	270K	NC	280Ω	250Ω	
V5	6V6GT	TP	280Ω	†320Ω	†3000Ω	270K	TP	280Ω	250Ω	
V6	6AX5GT	0Ω	280Ω	140Ω	TP	130Ω	NC	280Ω	20K(MIN)	

† MEASURED FROM PIN 8 OF V6.
■ MEASURED FROM PIN 8 OF V3.
NC NO CONNECTION.
TP TIE POINT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

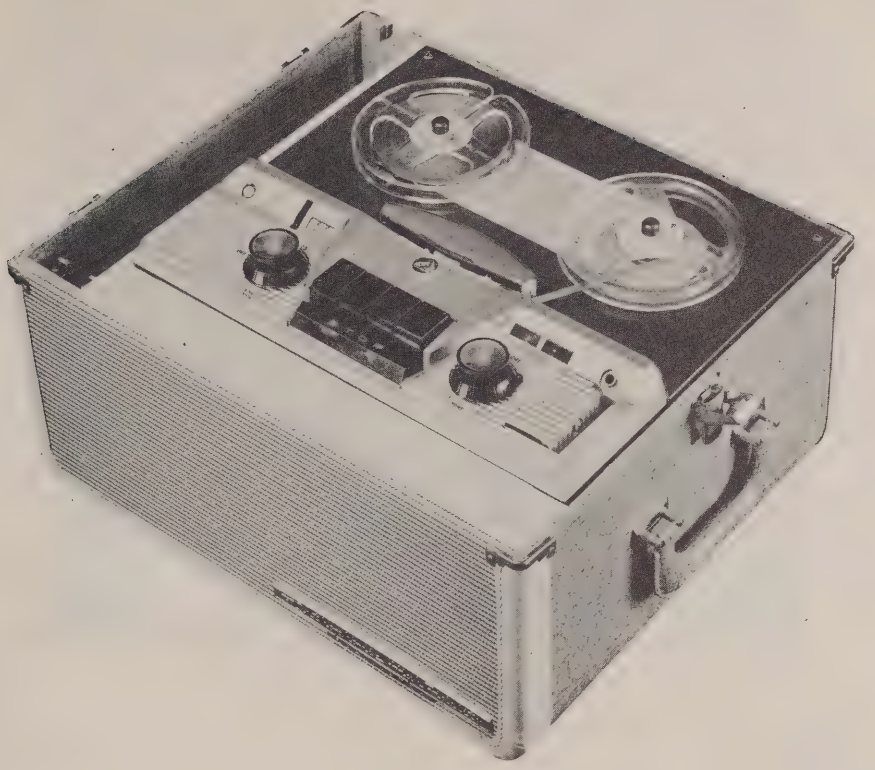
PHOTOFACT* Folder

*TRADE MARK

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

RCA VICTOR MODELS 8TR2, 8TR3
(Ch. RS-156F, H, TR-2A-1, -2)

RCA VICTOR MODELS 8TR2, 8TR3
(Ch. RS-156F, H, TR-2A-1, -2)



GENERAL INFORMATION

Models 8-TR-2 and 8-TR-3 are push-button tape recorders designed to record and reproduce sound using 1/4" magnetic-coated tape.

The recorders are dual-track mechanisms, in which one-half of the tape width is used during recording.

The tape speeds are 3.75" per second and 7.5" per second permitting up to two hours of speech recording or one hour of music recording on one seven inch reel of tape.

Two high-impedance inputs are provided and connected in such a manner as to permit mixing microphone input with radio-phono input. A low-impedance source, such as the voice coil of a loudspeaker, may also be used with the radio-phono input alone. The "Radio-Phono" jack can be used as both input and output.

On Model 8-TR-3, a window-type tape counter is provided.

RCA VICTOR MODELS 8TR2, 8TR3
(Ch. RS-156F, H, TR-2A-1, -2)

Manufactured by:

Radio Corporation Of America
RCA Victor Radio And "Victrola" Division
Camden 8, New Jersey

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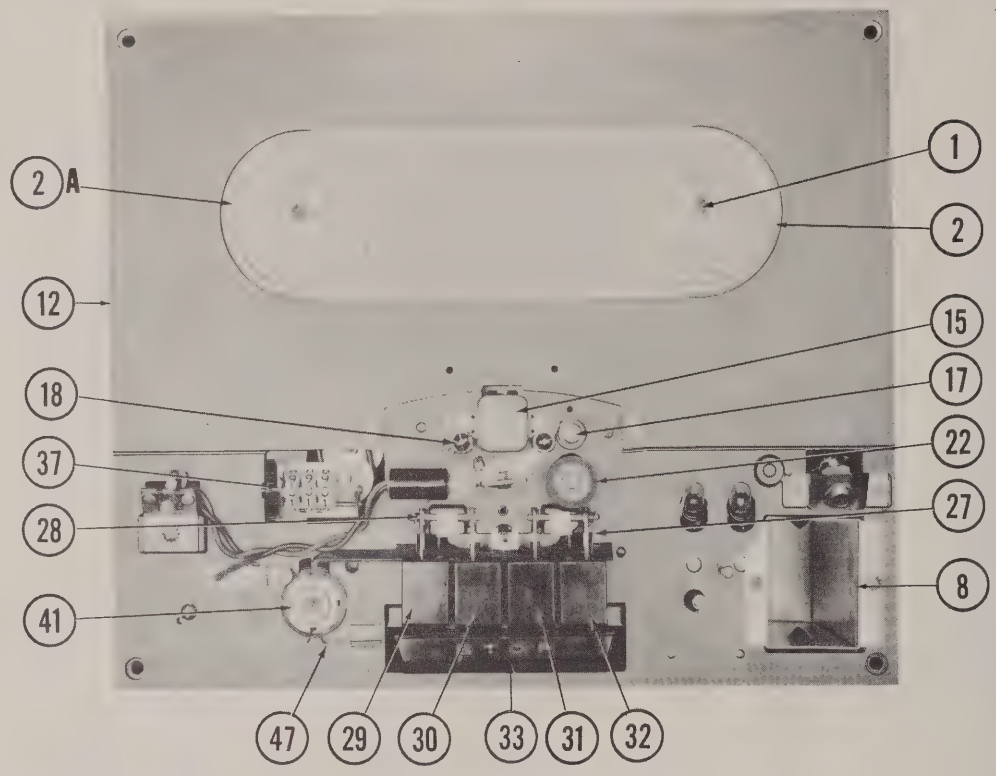


FIGURE 1

SPECIFICATIONS

Tape Speed

3.75" per second or 7.5" per second.

Record Or Playing Time

Up to 2 Hours.

Rewind Time

7" Reel (1200ft.) in less than 2 1/3 minutes.

Inputs

1. High impedance with preamplifier for microphone.
2. High impedance for record player or radio tuner. Low impedance source can be used.

Chassis Designations

Model	Amplifier Chassis	Tape Transport
8-TR-2	RS-156H	TR-2A-1
8-TR-3	RS-156F	TR-2A-2

Power Input

115 Volts 60 Cycle 100 Watts

Power Output

2.5 Watts undistorted

Speakers

One 5" x 7" PM (Model 8-TR-2) 3.2 Ohm V.C.
One 6 1/2" PM (Model 8-TR-3) 3.2 Ohm V.C.
Two 3 1/2" PM (Model 8-TR-3) 7 Ohm V.C.
Connection jack for external 3.2 Ohm speaker is also provided on Model 8-TR-3.

Cabinet Dimensions

Height--9 5/16" Width--18 1/16" Depth--14 11/16"

Weight (Net)

Model 8-TR-2----33 1/4 lb.
Model 8-TR-3----36 lb.

One #44 pilot lamp and two #NE51 recording level indicator lamps are used.

TAPE TRANSPORT CONTROL FUNCTION

Power Switch

By turning the left hand control knob to "3.75" or "7.5" the power is applied to the motor and amplifier. The tape drive speed is also selected by turning this knob. The interlock bar (9) prevents the knob from being turned when either of the two "Fast" pushbuttons are in the depressed position.

Tape Speed Selection

Turning the left hand control knob causes eccentric cams (116 and 120) mounted on the control shaft (123), to move either one or the other idler drive

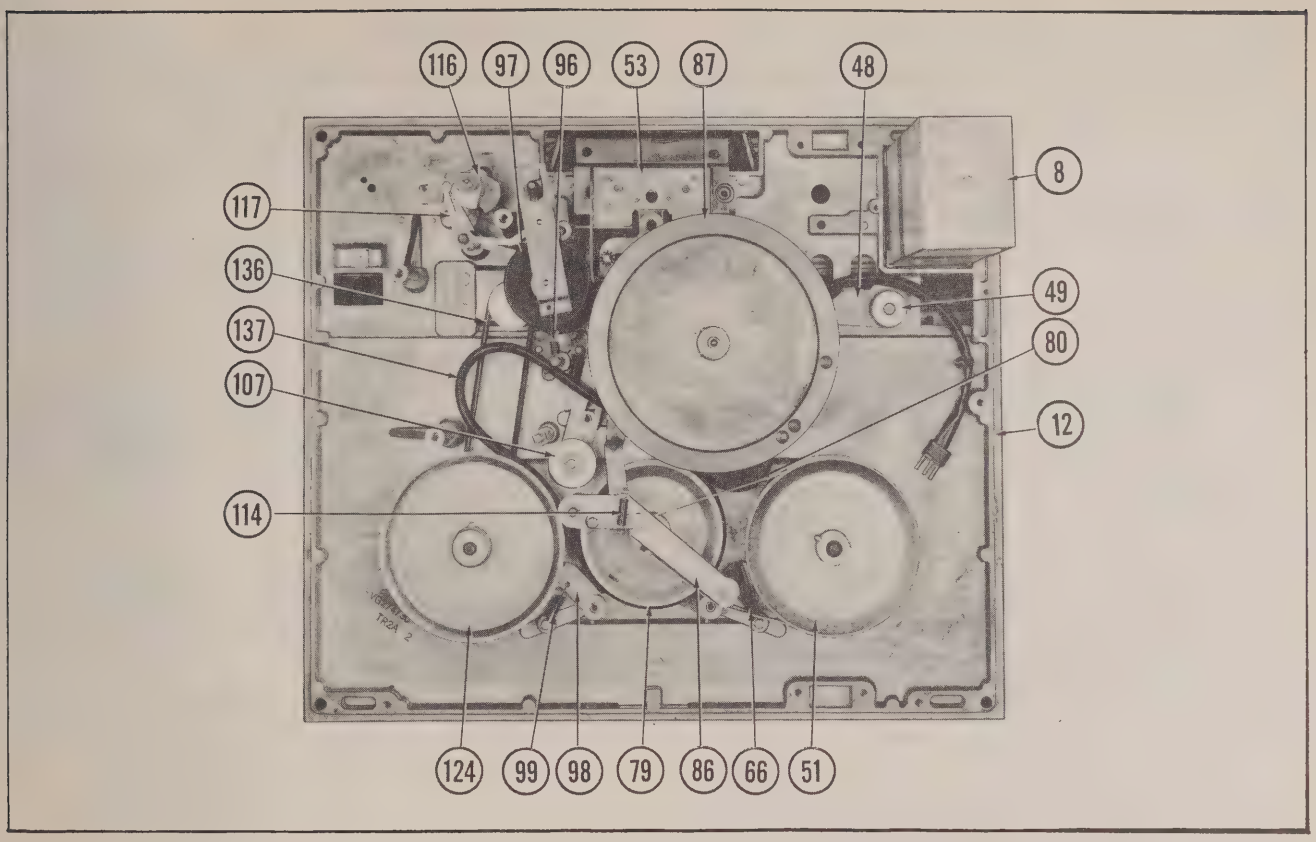


FIGURE 2

wheels (95 or 97) into contact with flywheel and stepped motor pulley (126).

Brake Release

Depressing either "Fast" pushbutton (30 or 31) will directly move brake release slide (67) against the tension of brake arm spring (66). This will move the brakes (65 and 98) away from takeup drive pulley (51) and rewind drive pulley (124). Depressing the "Play" pushbutton (29) will move pressure roller arm actuating slide (72) which will in turn move brake release slide (67) to the rear.

Takeup Drive

Main drive pulley (79) is belt driven from motor pulley (126) at constant speed independent of flywheel speed. Takeup drive pulley (51) is driven from small diameter section of dual drive pulley (79) by means of a flat belt (80). This belt is designed to slip on the dual drive pulley to provide a constant forward tension on the tape with any amount of tape on the right hand reel.

A spring loaded idler roller (84) is used to provide tension on the takeup belt (80).

Pressure Roller And Pressure Pad

A cam on the pushbutton indirectly forces pressure roller arm (48) to the rear when the "Play" pushbutton is depressed. Pressure roller (22) will then press tape firmly against the capstan (17). At this time, the pressure pad (54) will press the tape lightly against the head (15).

The tape is held away from the head by the tape hold-out lever (20) and spring (19) except when the "Play" pushbutton is depressed. The pressure roller arm (48) forces the hold out lever to the rear when the "Play" pushbutton is depressed.

Play

When the "Play" pushbutton (29) is depressed, it releases the brakes and forces the pressure roller (22) against the capstan.

Fast Forward

The cam pushes the drive idler slide (70) to the rear, when the "Fast Forward" pushbutton (31) is depressed, forcing the idler pulley assembly (77) into contact with the idler pulley assembly (79) and the take up drive pulley (51). This action drives the take up drive pulley at a fast speed.

Rewind

The cam pushes the rewind drive idler slide (104) to the rear, forcing the idler roller (107) against the main drive belt (137) when the "Fast Rewind" pushbutton (30) is depressed. The drive belt contacts the rewind pulley (124) and drives it at a fast speed.

Record

A cam on the pushbutton pushes down on push rod (64), which comes into contact with a switch lever that turns the "Play-Record" switch to the record position when the "Record" pushbutton (32) is depressed. The switch is returned to the Play position by spring tension when the Record pushbutton is released.

The tape is not set in motion when the Record pushbutton is depressed, but it does permit the recording level to be adjusted before starting a recording.

Stop

Any pushbutton which may have been depressed can be released at any time by depressing the "Stop" bar (33). This allows the brake pads to contact the takeup drive pulley (51) and the rewind drive pulley (124) by releasing the brake release slide (67) so it can be pushed forward by the springs attached to the brake arms (65 and 98).

Recording From Radio Or Phonograph

NOTE: CAREFUL CONSIDERATION MUST BE GIVEN TO THE CIRCUIT OF THE INSTRUMENT TO WHICH THE TAPE RECORDER IS TO BE CONNECTED.

The Radio-Phono jack is designed for connection to a low impedance source, such as the voice coil terminals of the loudspeaker, or to a high impedance source of a radio or phonograph, such as the volume control circuit.

If the Radio-Phono connecting cable is connected to a low impedance source, it will have to be disconnected before the microphone will provide any recording signal and the recorder can not be used for playback.

If conditions such as shock hazard or interference with voltages in the volume control circuit when direct connection to the volume control circuit is made, capacitors should be used between the volume control and the interconnecting cables. (.047mfd between shield and low side, .01mfd between high side and center conductor).

An isolation transformer should be used between the radio or phonograph and the power line to prevent shock hazard if the radio or phonograph is of the "AC-DC" type or does not use a transformer.

ADJUSTMENTS

Record-Playback Head Adjustment

1. Thread a standard frequency tape on the recorder.
2. Adjust the Right Hand Tape Guide for maximum output and Left Hand Tape Guide so that the tape is approximately level across the front of the head and maximum output is maintained while playing the 1000 cycle section of tape.
3. Adjust the Head Mounting Screws for the angular position of the head which will give maximum output while playing the 12,000 cycle section of tape. The head should be as far forward as possible and the mounting screws tight.

Oscillator Frequency

The oscillator frequency is fixed at approximately 45KC and is not critical and does not require adjustment.

Erase Voltage

An A.C. voltage of approximately 45KC is applied to the erase coil of the head for erasing. The level of the erase voltage and recording bias is adjusted by the bias level trimmer (C10A).

Brake Pad Adjustment

The brakes (65 and 98) should engage the drums with equal force and at the same time. The brakes should engage the drums (51 and 124) with the maximum area. Do not bend the brake arm at an angle to equalize timing.

To adjust the brakes, bend the ends of the brake arm actuating lever (67). The actuating lever is accessible by removing drive pulley (79).

Recording Bias Adjustment.

The only time the recording bias should require adjustment is when the 5879 tube is replaced. This adjustment can be made by removing the bottom cover from the cabinet and adjusting the bias adjustment trimmer (C10A)

To adjust the bias, proceed as follows:

1. Connect a low capacity type AC VTVM to test point TP-1

2. Turn the recorder on and depress the "Record" pushbutton.

3. Turn volume control to minimum.

4. Adjust trimmer (C10A) to obtain a meter reading of 40 volts r.m.s.

Pressure Roller Adjustment

The force on the pressure roller (22) which holds the tape tight against the capstan (17) during play is maintained by the formed spring (57) on the pressure roller arm (48). With the "Play" pushbutton depressed, the proper spring tension may be measured by pulling the pressure roller (22) away from the capstan (17). This may be done by fastening a string to the pressure roller arm (48) on which the pressure pad assembly (54) is mounted and with a spring scale, the necessary force to pull the pressure roller away from the capstan can be measured. The necessary force should be 4 to 6 pounds.

One mounting hole of the spring is slotted to permit adjustment.

Pressure Pad Adjustment

There must be clearance between the retaining lugs of the pad assembly and its mounting so it will not bind on its mounting when pressed against the head.

Since the tension of the pressure pad spring (54A) is fixed, the only adjustment is by the front to rear position of the Record-Play head (15). The head should be as far forward as is necessary for the pressure pad to hold the tape lightly against the face of the head. The pressure pad should be forced approximately 1/16 inch closer to its support under this condition.

Recording Level Indicators

Two neon bulbs, type NE-51, are used for recording level indicators. The only adjustment required is when a neon bulb is replaced. The firing

level is adjusted by means of two trimmer capacitors (C10B and C10C). The trimmers are accessible after the cabinet bottom cover is removed.

To adjust the firing level of the recording indicator lamps, the mechanism must be completely assembled and placed in the cabinet and follow the procedure below:

1. Connect an audio signal generator to the "Radio-Phono" jack. Set signal generator frequency to 1000 cycles.

2. Connect a VTVM to the voice coil terminals of the large speaker.

3. Depress "Stop" bar. Adjust signal generator output and / or tape recorder volume control to provide .67 volts r.m.s. reading on the VTVM.

4. Depress the "Record" pushbutton and adjust the Normal indicator trimmer (C10B) first clockwise until Normal bulb no longer lights and then slowly counter-clockwise until the Normal neon bulb barely lights.

5. Depress "Stop" bar. Adjust signal generator output and/ or tape recorder volume control to provide 1.02 volts r.m.s. reading on the VTVM.

6. Depress the "Record" pushbutton and adjust the Overload trimmer (C10C) first clockwise until Overload bulb no longer lights and then slowly counter-clockwise so the Overload neon bulb barely lights.

Hum Control

Adjust the hum control (R2) for minimum hum with the volume control to maximum and the recorder in play position.

CLEANING

The record head, capstan and pressure roller are subject to an accumulation of tape coating residue that is worn off the tape as it passes these parts. Use a soft cloth and alcohol to clean the head surfaces, capstan and pressure roller. Never use a brush when cleaning the recording head as this could mar the lamination.

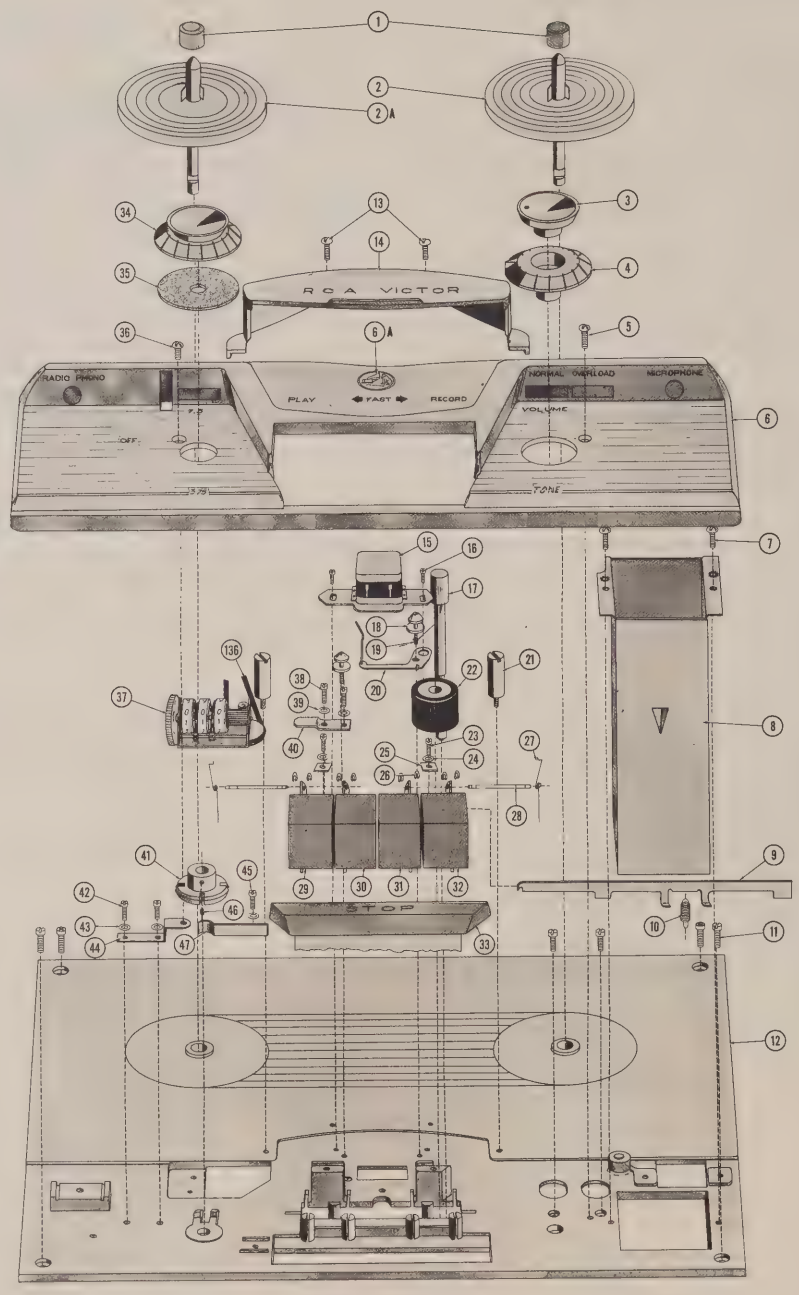
It is desirable to clean the foreign matter from under the plastic escutcheons occasionally.

The rubber tired idler wheels and pressure rollers must be kept free from oil or grease. To clean oil or grease from rubber parts, use a soft cloth and alcohol or carbon tetrachloride.

Use care to prevent cleaning fluids from removing lubricant from "Oilite" bearings.

TROUBLE CHART

Symptom	Cause	Remedy
1. Push buttons fail to latch into position.	1. "Stop" bar compression spring (10) broken.	1. Replace.
2. Fails to erase.	1. Open erase coil in head (15).	1. Replace head.
	2. Weak output tube.	2. Replace.
	3. Record-Play switch actuating lever improperly positioned on switch shaft.	3. Check to see if the actuating lever is in correct position so the switch can be fully actuated in both directions.
	4. Left-hand tape guide (18) improperly adjusted.	4. Re-adjust tape guide.
	5. Bias adjustment may be incorrect.	5. Check to see if there is 40 volts r.m.s. on Bias Oscillator.
3. No fast forward or rewind.	1. Fast forward idler drive (77) or rewind idler drive (107) missing.	1. Replace.
	2. Broken pressure spring on arm (104) or arm (70).	2. Replace pressure spring.
4. No drive on take-up reel.	1. Take-up drive belt (80) broken.	1. Replace.
	2. Bind in bearing of take-up hub (2).	2. Check for foreign matter, remove and lubricate.
	3. Tape improperly threaded.	3. See that tape is threaded in proper direction.
	4. Bind in bearing of take-up arm (86) or take-up arm roller (84).	4. Check for foreign matter and clean.



A PHOTOFACT "EXPLODED" VIEW
Howard W. Sams & Co., Inc. 1958

FIGURE 3A. EXPLODED VIEW OF PARTS ABOVE BASEPLATE

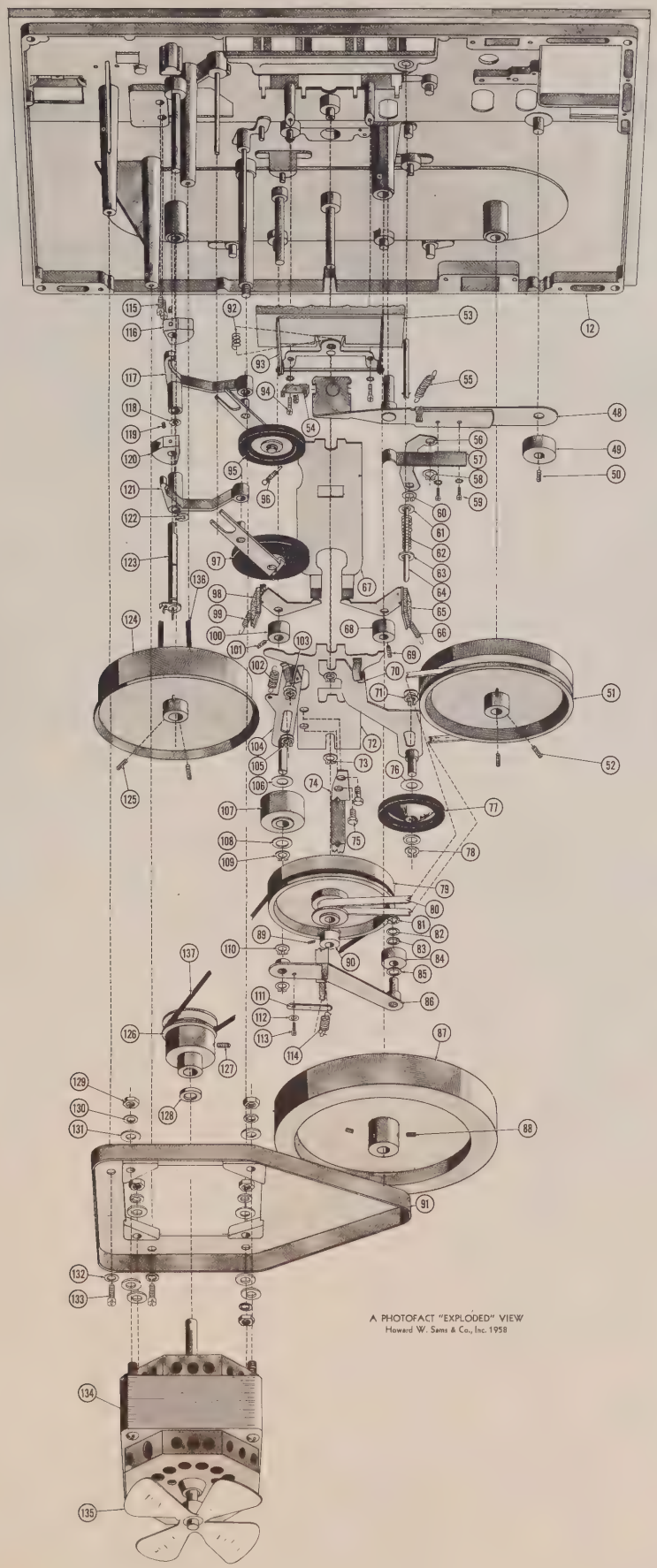
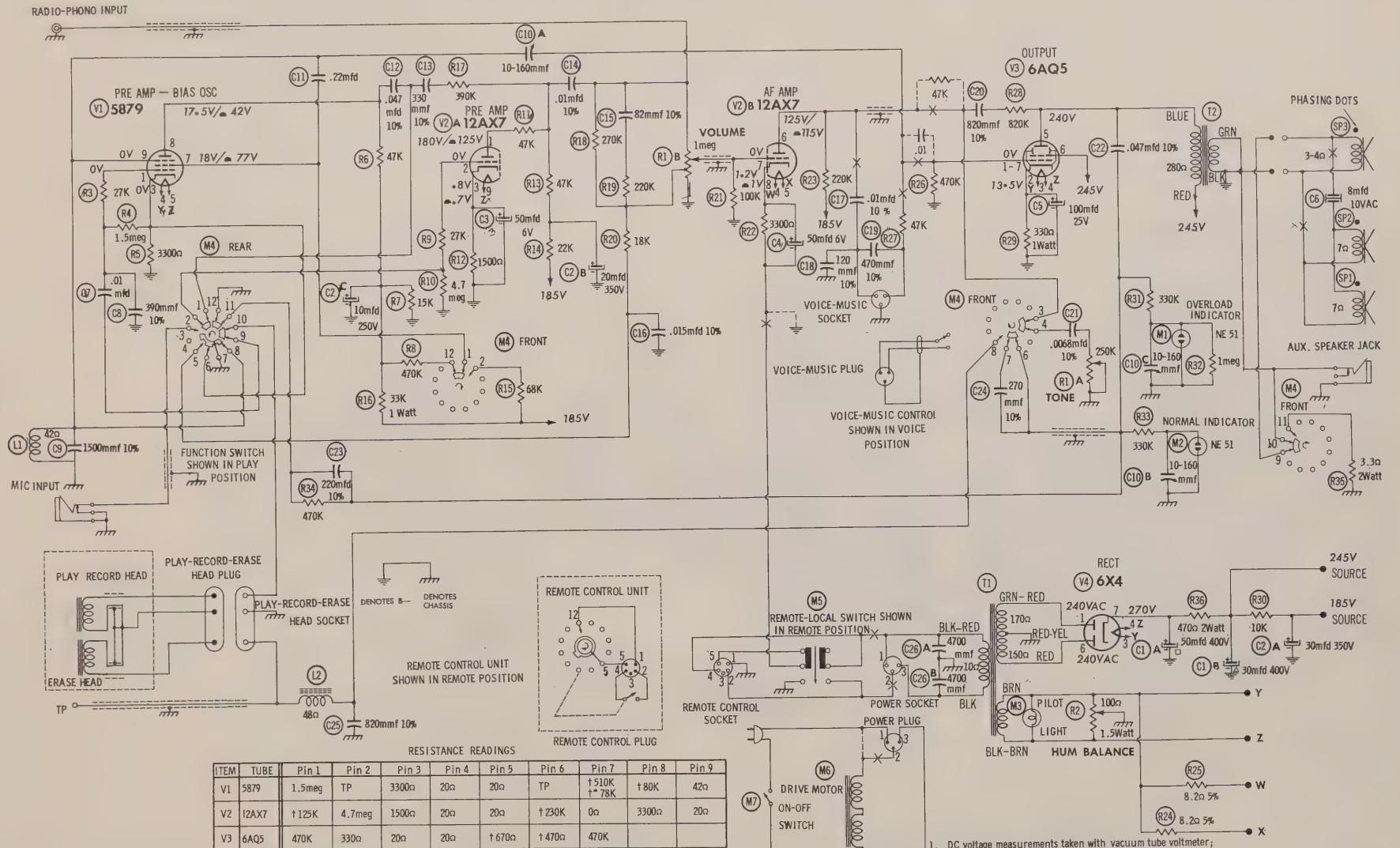


FIGURE 3B. EXPLODED VIEW OF PARTS BELOW BASEPLATE



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	5879	1.5meg	TP	3300Ω	20Ω	20Ω	TP	†510K †*78K	†80K	42Ω
V2	12AX7	†125K	4.7meg	1500Ω	20Ω	20Ω	†230K	0Ω	3300Ω	20Ω
V3	6AQ5	470K	330Ω	20Ω	20Ω	†670Ω	†470Ω	470K		
V4	6X4	170Ω	NC	20Ω	20Ω	NC	160Ω	20K(Min)		

ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED

† MEASURED FROM PIN 7 OF V4

* MEASURED IN "RECORD" POSITION

NC NO CONNECTION

TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

397-10

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Preamp. - Bias Osc.	5879	
V2	Preamp. - AF Amp.	12AX7	
V3	Output	6AQ5	
V4	Rectifier	6X4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA RCA Victor PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■50	400	103242		A0490	FP259	TMS-56	S-275	R2632 *
B	▲30	400			BR3045	TC78	TD-50-450	MT-4530	
C2A	30	350	101946	PR4-175	BBRQ0695. 3	TCT3764	CDB-Q-4422	D-165	R2331 *
B	20	350						MT-4510	
C	10	250							
C3	50	6	78573	SRE6V50	BBR50-6	TT6X50	TD-50-6	MMT-650	TVA-1100
C4	50	6	78573	SRE6V50	BBR50-6	TT6X50	TD-50-6	MMT-650	TVA-1100
C5	100	25 (1)	100552	PRS25V100	BBR100-25	TC2501	TD-100-25	MTH-2510	TVA-1207
C6	8	10AC(2)	100509	AC-PRS10V8	BBR16-90 † BBR16-90 †	TC108	TD-16-150 † TD-16-150 †	MT-1516 † MT-1516 †	R2201 *

* Non Catalog Item † Connect Negative Leads

(1) Model 8-TR-2 used a 25mfd @ 25 Volts, Part #59928.

(2) Not used in Model 8-TR-2

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C7	.01	200	73561					GEM-1611		10%
C8	390		75641		D6-391	L10T39	GP-390		MS-391	
C9	1500		75610			1R5D15	GP-1500		MS-215	
C10A	10-160									
B	10-160		101717							
C	10-160									
C11	.22	400	73794	P288N-22		CUB4P22		GEM-4022	4TM-P22	
C12	.047	400	73553							10%
C13	330		76552		D6-331	L10T33	GP-330		MS-331	10%
C14	.01	400	73561					GEM-1611		10%
C15	82		101836		D6-820	L10Q82	GP-82		MS-482	10%
C16	.015	200	77943							10%
C17	.01	400	73561					GEM-1611		10%
C18	120		78142		D6-121	L10T12	GP-120		MS-312	10% ①
C19	470		94223		D6-471	5R5T47	GP-470		MS-471	10% ②③
C20	820		76864			1R5T82	GP-820		MS-382	10% ③
C21	.0068	400	78789					GEM-16268		10%
C22	.047	400	73553							10%
C23	220		102015		D6-221	L10T22	GP-220		MS-322	10%
C24	270		101373		D6-271	L10T27	GP-270		MS-327	10%
C25	820		76864				GP-820		MS-382	10%
C26A	4700		76470							10%
B	4700									10%

① Model 8-TR-2 uses 100mmf 10% in this application Part #101853.

② Not used in Model 8-TR-2.

③ Model 8-TR-2 uses . 330mmf 10% in this application Part #76552.

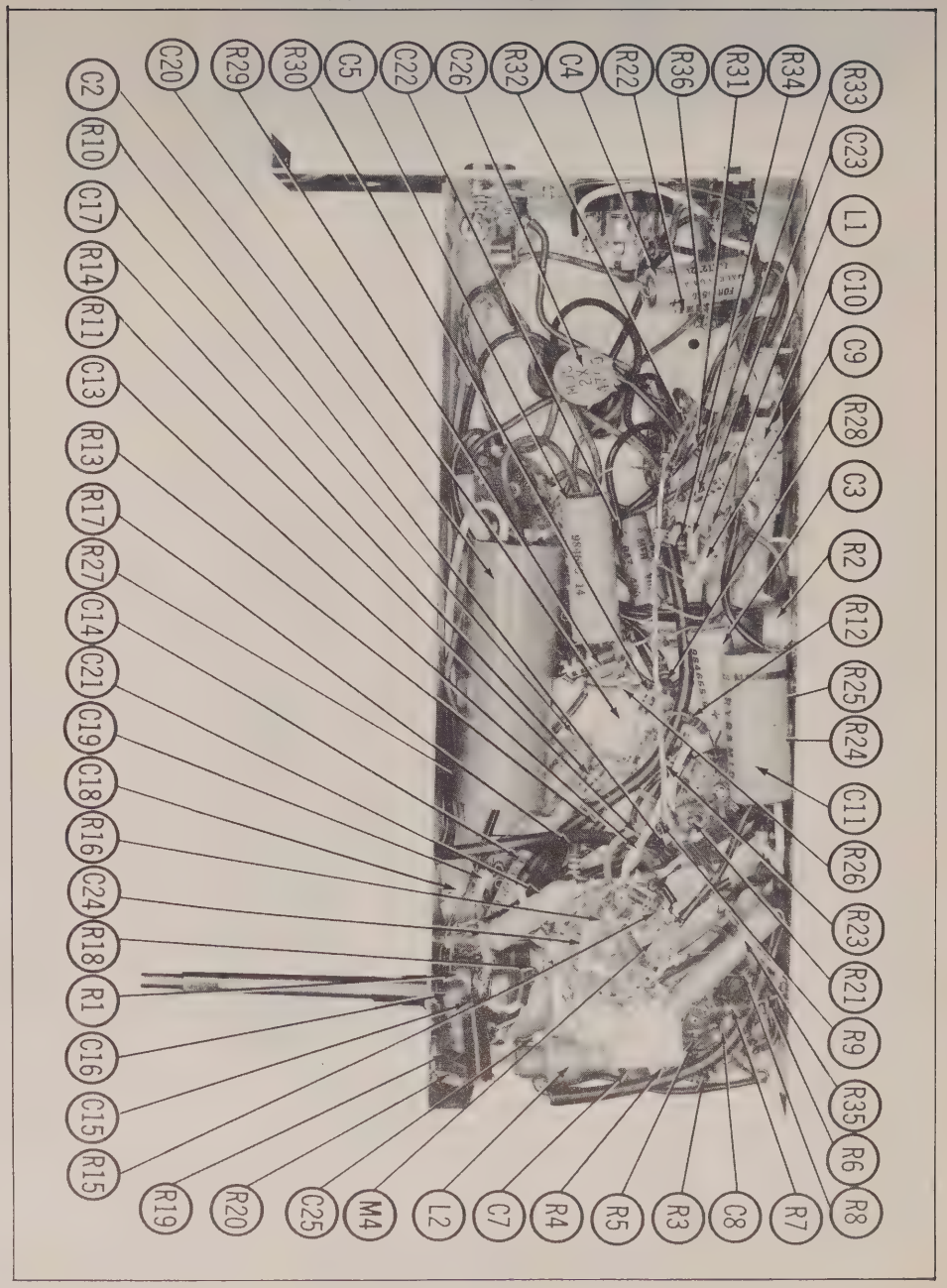
CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA Victor PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	250K	½	10716	F1-35		■ QJ-961R	■■ UE3799	Tone
B	1meg			R2-57				Volume, Tap @ 200K
R2	100Ω	1.5	102422		39-100		FL-150	Hum Balance (Wire Wound)

■ Not available as a Factory Assembled Control. "Concentrikit" Equivalent;
K-7 Kit, Base Elements and Shafts: B13-130, P17-300 (Panel)
B13-137X, R1-316 (Rear)

■■ "STA-LOC" Equivalent; FD254A, OF3000, RU16T25, IS3562

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	RCA Victor PART No.	NOTES
R3	27K		502327	
R4	1.5meg		502515	
R5	3300Ω		502233	
R6	47K		502347	
R7	15K		502315	
R8	470K		502447	
R9	27K		502327	
R10	4.7meg			①
R11	47K		502347	
R12	1500Ω		502215	
R13	47K		502347	
R14	22K		502322	
R15	68K		502368	
R16	33K	1	512333	
R17	390K		502439	
R18	270K		502427	
R19	220K		502422	
R20	18K		502318	
R21	100K		502410	
R22	3300Ω		502233	
R23	220K		502422	
R24	8.2Ω 5%		101852	
R25	8.2Ω 5%		101852	
R26	470K		502447	
R27	47K		502347	②
R28	820K		502482	③
R29	330Ω	1	512133	
R30	10K		502310	
R31	330K		502433	
R32	1meg		502510	
R33	330K		502433	
R34	470K		502447	
R35	3.3Ω	2	103289	
R36	470Ω	2	522147	

① Model 8-TR-2 uses 390K in this application Part #502439.
② Not used in Model 8-TR-2.
③ Model 8-TR-2 uses 1.5meg in this application Part #502515.

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA RCA Victor PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	3½"	PM	7Ω	100465	3A15TZ6.6	① Used in Model 8-TR-3 only
SP2	3½"	PM	7Ω	100465	3A15TZ6.6	
SP3	6½"	PM	3-4Ω	100464	6A21 ①	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .42A	480VCT @ .067A	6.3VAC @ 2.5A		101849	P9212	P-3147	PC-8419	24R004	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	5500Ω	3-4Ω	101718	Z1007	A-3019		A-8092	26S49	S-5Z	

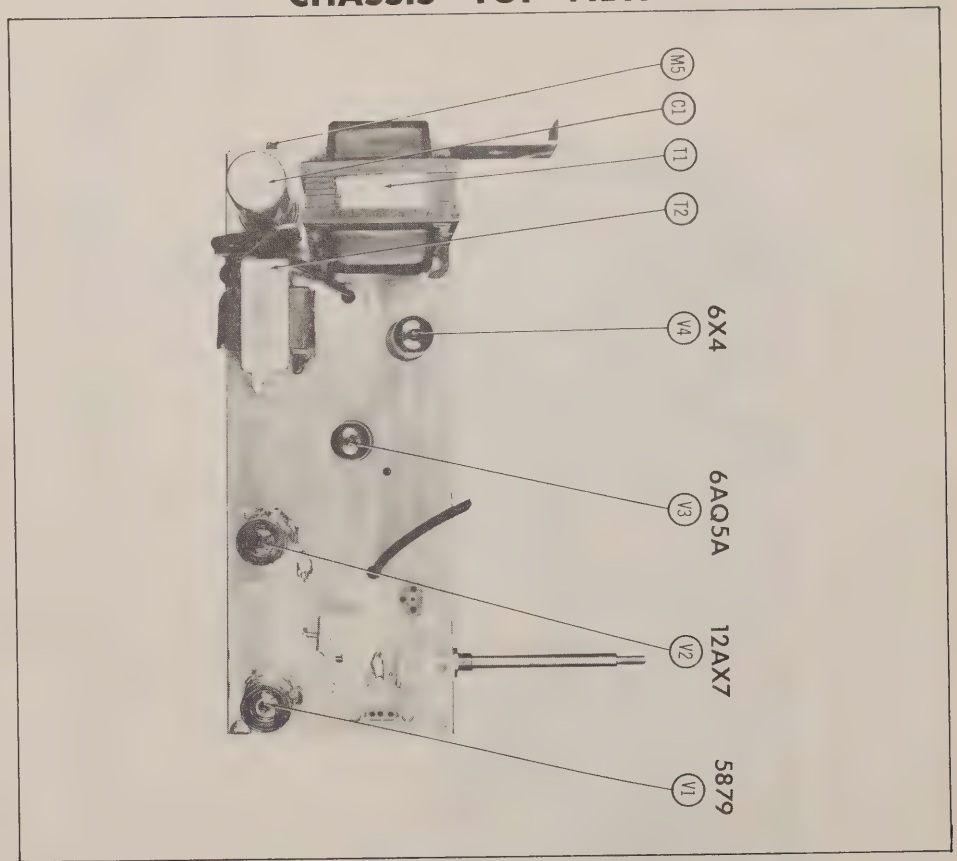
COILS

ITEM No.	USE	REPLACEMENT DATA RCA Victor PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Bias Osc.	101722					
L2	Peaking Coil	103500					

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M1	Lamp	101857	Indicator, Neon, NE51
M2	Lamp	101857	Indicator, Neon, NE51
M3	Lamp	11891	Pilot, #44
M4	Switch	104506	Function, 2 Section Rotary Wafer Type
M5	Switch		Local-Remote, DPDT Slide Type
M6	Motor	105350	Drive
M7	Switch	101484	On-Off Switch

CHASSIS—TOP VIEW



CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	104505	Control, Moulded Phenolic, Black, Large Diameter for Switch only
Knob	104513	Control, Moulded Phenolic, Black, Small Diameter for Switch or Vol. Control
Knob	101706	Tone, Black, Large Diameter
Cabinet	X4183	Complete with Hardware and Trim, Charcoal, Model 8-TR-2
Cabinet	X4184	Complete with Hardware and Trim, Tan-Brown, Model 8-TR-2
Cabinet	X4185	Complete with Hardware and Trim, Gray, Model 8-TR-3
Cabinet	X4186	Complete with Hardware and Trim, Green, Model 8-TR-3
Handle	104551	Pastel Gray, Model 8-TR-2
Handle	104552	Light Suntan, Model 8-TR-2
Handle	104507	Gray, Model 8-TR-3
Handle	104508	Green, Model 8-TR-3

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

TROUBLE CHART (CON'T)

Symptom	Cause	Remedy
5. Speed variation or "Wow".	1. Check capstan (17) pressure roller (22) idler wheels (95 and 97) main drive pulley (79) and main drive belt (137) for presence of oil or foreign material.	1. Clean contact surfaces with cleaning fluid.
	2. Check setscrews in motor pulley (126) and flywheel (87) for tightness.	2. If motor pulley or flywheel is loose, tighten.
	3. Check pressure roller arm tension spring(47).	3. Pressure roller must have sufficient force on capstan (17) to prevent slippage.
	4. Check speed selection slide (95A and 97A) for freedom of movement and slide tension spring (96 and 97B) for tension.	4. Make sure the speed selection slides are free of foreign matter and the slide tension springs have enough tension.
6. Tape overruns or spills when bar is depressed during fast forward or rewind.	1. Brakes not adjusted properly.	1. See "Brake Adjustment" under Adjustments.
	2. Brake pads worn out.	2. Replace.
	3. Unequal tension of brake spring (66 and 99).	3. Make sure the tension is equal.
7. Failure to record or play.	1. Pressure pad (54) fails to hold tape against head (15).	1. Spring (54A) misplaced.
	2. Right-hand tape guide (18) improperly positioned.	2. Make sure tape guide is adjusted properly.
	3. Tape improperly threaded.	3. Make sure dull side of tape faces inward on reel and against head.
	4. Open circuit in head or connecting cable.	4. Check head and connecting cable and if open, replace.
	5. Defect in amplifier circuit.	5. Check amplifier components for shorts, opens etc.
	6. Record-Play switch actuating rod (64) missing.	6. Replace.

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	76787	Tape Reel Retainer (2)			
2	104509	Right Hand Reel Hub and Shaft Ass'y		104504	Record, Play, Erase Head Cover Model 8-TR-3
2A	104510	Left Hand Reel Hub and Shaft Ass'y			
3	104513	Switch and Volume Control Knob	15	101494	Record, Play, Erase Head With Leads and Connector
4	101706	Tone Control Knob			
5		Screw-#6-32 x 3/4" Fil. Hd.	16		Screw-#6-32 x 1/4" Fil. Hd.
6	104515	Escutcheon For Model 8-TR-2	17	101474A	Capstan Shaft
	104514	Escutcheon For Model 8-TR-3	18	101493	Tape Guide Post (2)
6A	100162	Trademark Emblem	19	103864	Torsion Spring For Tape Holdout Lever
7		Screw-#6-32 x 3/16" Binding Head			
8	101707	Microphone Housing	20	105351	Tape Holdout Lever Ass'y.
9	101483	Fast Forward or Rewind Interlock Bar	21	101956	Tape Guide Post (2)
			22	101475	Tape Pressure Roller
10	101514	Interlock Bar Tension Spring	23		Screw-#6-32 x 1/4" Fil. Hd.
11		Mounting Screws (4)	24		Washer-#6 Split Lockwasher
12	104496	Baseplate, Clove Bronze Metalustre Enamenl Model 8-TR-2	25	101487	Push Button Ass'y. Shaft Retainer
			26	101517	Grip Ring
	104497	Baseplate, Champagne Gold Metalustre Enamenl Model 8-TR-3	27	101744	Play Button Return Spring
			28	101486	Pivot Shaft For Push Button Ass'y.
13		Screw-#8-32 x 1/2" long (2)	29	101464	Play Button and Cam Ass'y.
14	104503	Record, Play, Erase Head Cover Model 8-TR-2	30	101465	Rewind Button and Cam Ass'y.

MECHANICAL PARTS LIST-CON'T

Ref. No.	Part No.	Description
31	101466	Fast Forward Button and Cam Ass'y.
32	103280	Record Push Button Ass'y.
33	101478	Stop Bar
34	104505	Control Knob-Larger Diameter For Switch Only
35	101861	Black Felt Washer
36		Screw-#6-32 x 3/8"
37	101480	Tape Counter With Knurled Knob and Pulley-Model 8-TR-3 Only
38		Screw-#6-32 x 1/4" Fil. Hd.
39		Washer-#6 Split Lockwasher
40		Pilot Light Mounting Bracket
41	101481	Interlock Detent Collar
42		Screw-#6-32 x 1/4" Fil. Hd.
43		Washer-#6 Split Lockwasher
44		Front Escutcheon Mounting Bracket
45		Screw-#6-32 x 3/16" Fil. Hd.
46	14974	Set Screw, #8-32 x 3/16" For Interlock Collar
47	101454	Speed Change Detent Spring
48	101449	Pressure Roller Arm
49	101448	Pressure Roller Arm Retaining Collar
50	101592	Set Screw-#8-32 x 1/4" Cup Pt.
51	103271	Takeup Drive Pulley
52	101592	Set Screw-#8-32 x 1/4" Cup Pt.
53	101477	Pushbutton Release Latch and Bar Ass'y.
54	101490	Pressure Pad Ass'y.
54A	101479	Pressure Pad Spring
55	71099	Pressure Roller Arm Return Spring
56	101957	Pressure Roller Arm Support Plate
57	101450	Pressure Roller Arm Spring
58	101500	Grip Ring
59		Screw-#6-32 x 3/16" Fil. Hd
60	101500	Grip Ring
61		Washer
62		Spring
63		Washer
64		Record Actuating Shaft
65	101499	Right Hand Brake Arm With Pad
66	101511	Brake Arm Spring
67	101446	Brake Release Slide
68	101767	Brake Arm Retaining Collar
69	101592	Set Screw-#8-32 x 1/4" Cup Pt.
70	105393	Fast Forward Drive Roller Actuating Slide Ass'y.
71	101500	Grip Ring (2)
72	103341	Pressure Roller Arm Actuating Slide
73	101500	Grip Ring
74	103346	Takeup Spring Mounting Bracket
75		Screw-#6 x 1/4" Hex Head Tapping Screw
76	101502	Phenolic Washer, 1/2" O.D. x .188" I.D. x .010" Thk.
77	101492	Fast Forward Drive Roller
78	101500	Grip Ring
79	103282	Idler Pulley Ass'y.
80	103283	Takeup Pulley Drive Belt
81	101517	Grip Ring
82	100196	Washer-Steel, .240" O.D. x .130" I.D. x .010" Thk.
83	100198	Washer-Fibre, .240" O.D. x .130" I.D. x .005" Thk.
84	103275	Takeup Belt Tension Roller
85	100198	Washer-Fibre, .240" O.D. x .130" I.D. x .005" Thk.
86	103276	Takeup Arm Ass'y.
87	101476A	Capstan Drive Flywheel
88	101592	Set Screw-#8-32 x 1/4" Cup Pt.
89	70527	Allen Head Set Screw-#6-32 x 1/8"
90	105617	Retaining Collar For Dual Pulley Ass'y.
91	101459	Motor Mounting Plate and Capstan Shaft Bearing Plate Ass'y.
92	101515	Pushbutton Latch Tension Spring
93	101452	Pushbutton Latch Mounting Bracket
94		Screw-#6-32 x 1/4" Fil. Hd.
95	105386	Speed Selection Idler Wheel-7.5" Per Second
95A	105366	Speed Selection Slide (7.5"/Per Sec.)
96	105391	Speed Selection Slide Tension Spring
97	105387	Speed Selection Idler Wheel-3.75" Per Second
97A	105367	Speed Selection Slide (3.75"/Per Sec.)
98	103670	Left Hand Brake Arm For Model 8-TR-2
	101497	Left Hand Brake Arm For Model 8-TR-3
99	101511	Brake Arm Spring
100	101767	Brake Arm Retaining Collar
101	101592	Set Screw-#8-32 x 1/4" Cup Pt.
102	103253	Rewind Slide Return Spring
103	101500	Grip Ring
104	101456	Rewind Drive Idler Actuating Slide
105	101500	Grip Ring
106	101502	Phenolic Washer-1/2" O.D. x .188" I.D. x .010" Thk.
107	101467	Rewind Drive Roller
108	74078	Cambric Washer-.328" O.D. x .195" I.D. x .005" Thk.
109	101500	Grip Ring
110	101500	Grip Ring
111		Takeup Arm Stop
112		Washer-#6 Split Lockwasher
113		Screw
114	101512	Takeup Arm Tension Spring
115		Screw
116	105338	Speed Selection Cam
117	105389	Speed Selection Arm-7.5" Per Second.
118	101508	"C" Washer
119	101505	Set Screw-#6-32 x 1/4" Cup Point
120	105338	Speed Selection Cam
121	105390	Speed Selection Arm-3.75" Per Second.
122	101508	"C" Washer
123	105359	Speed Selection Shaft and Switch Lever
124	101468	Rewind Drive Pulley
125	101592	Set Screw-#8-32 x 1/4" Cup Point
126	101473A	Motor Drive Pulley
127	101592	Set Screw-#8-32 x 1/4" Cup Point
128		Washer
129		Hex Nut-#10-32
130		#6-Split Lockwasher
131		Flat Metal Washer
132		Washer
133		Screw-#8-32 x 1/4" Binding Hd.
134	105350	Drive Motor, 115 Volts 50/60 Cycle
135	101462	Motor Fan With Set Screw
136	101457	Counter Drive Belt-Model 8-TR-3 Only
137	105392	Main Drive Belt

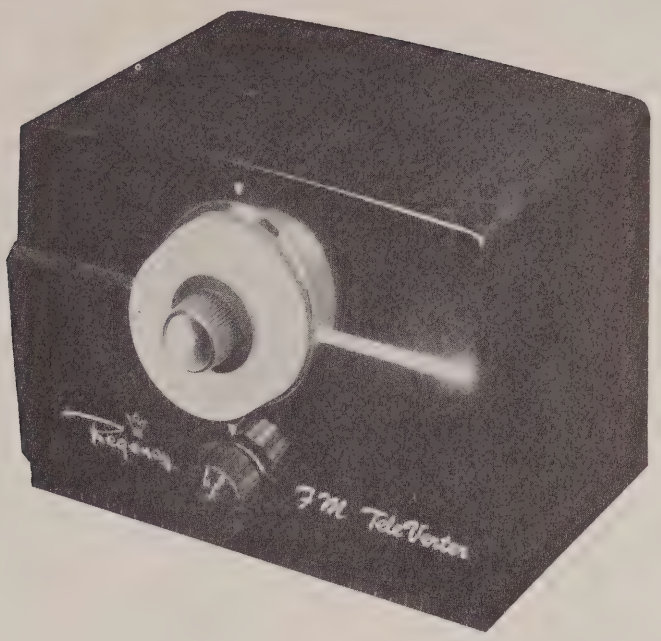
PHOTOFACT* Folder

*TRADE MARK

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

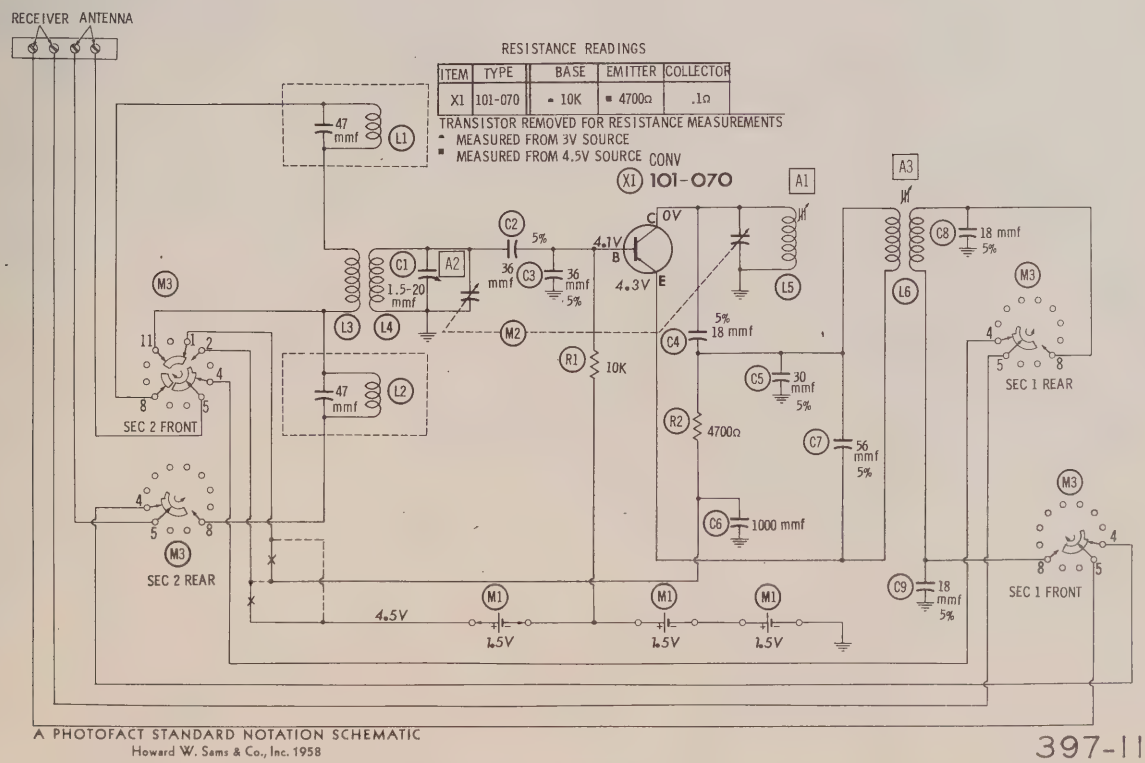
REGENCY
MODEL RC-103

REGENCY
MODEL RC-103



TRADE NAME	Regency Model RC-103
MANUFACTURER	Regency Div., I.D.E.A., Inc., 7900 Pendleton Pike, Indianapolis 26, Indiana.
TYPE SET	Battery Operated Transistorized FM Converter
POWER SUPPLY	4.5 Volts DC
TUNING RANGE	Converter: 88-108MC RATING .14MA @ 4.5 Volts DC TV Receiver: Channel 3 or 4. For best results, use Channel 3 for low frequency FM stations and Channel 4 for high frequency FM stations. Channels 2 and 5 may be used similarly in some instances.

REGENCY
MODEL RC-103



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Howard W. Sams & Co., Inc. 1958

397-11

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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H380

SET 397 FOLDER 11

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	101-070	Converter				

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	REGENCY PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1	1.5-20		40-402							
C2	36		15-360	1469-000036	TCZ-36	22R5Q36	CY10C360V		MS-436	5%
C3	36		15-360	1469-000036	TCZ-36	22R5Q36	CY10C360V		MS-436	5%
C4	18		15-180	1469-000018	TCZ-18	22R5Q18	CY10C180V		MS-418	5%
C5	30		15-300	1469-00003	TCZ-30	22R5Q3	CY10C300V		MS-43	5%
C6	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C7	56		15-560	1469-000056	TCZ-56	22R5Q56	CY10C560K		MS-456	5%
C8	18		15-180	1469-000018	TCZ-18	22R5Q18	CY10C180V		MS-418	5%
C9	18		15-180	1469-000018	TCZ-18	22R5Q18	CY10C180V		MS-418	5%

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REGENCY PART No.	NOTES
	OHMS	WATT		
R1	10K		30-003-103	

ITEM No.	RATING		REGENCY PART No.	NOTES
	OHMS	WATT		
R2	4700Ω		30-003-472	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		REGENCY PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Channel 6 Trap	101-060					Includes 47mmf Cap.
L2	Channel 6 Trap	101-060					Includes 47mmf Cap.
L3	Ant. Coil	101-081-2					
L4	Ant. Coil	101-081-1					
L5	Osc. Coil	300-699					
L6	Output Trans.	300-698					

BATTERIES

ITEM No.	VOLTAGE	PART No.	REPLACEMENT DATA								NOTES
			BURGESS		EVEREADY		MALLORY		RAY-O-VAC		
			"A"	"B"	"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V		Z		915		M-15R		7R		3 in series

MISCELLANEOUS

ITEM No.	PART NAME	REGENCY PART No.	NOTES
M2	Tuning Capacitor	300-570-2	2 Gang
M3	Switch	100-383-1	Selector (Rotary, Wafer Type)

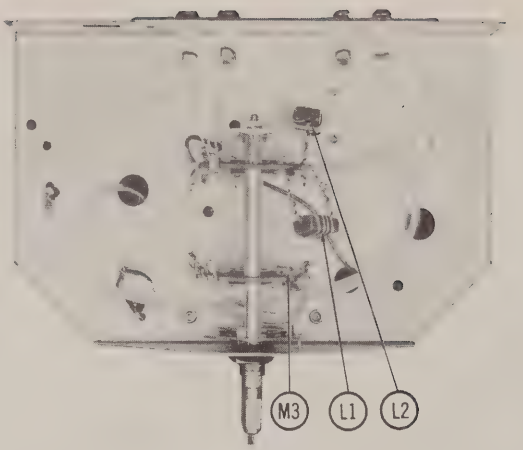
CABINETS & CABINET PARTS

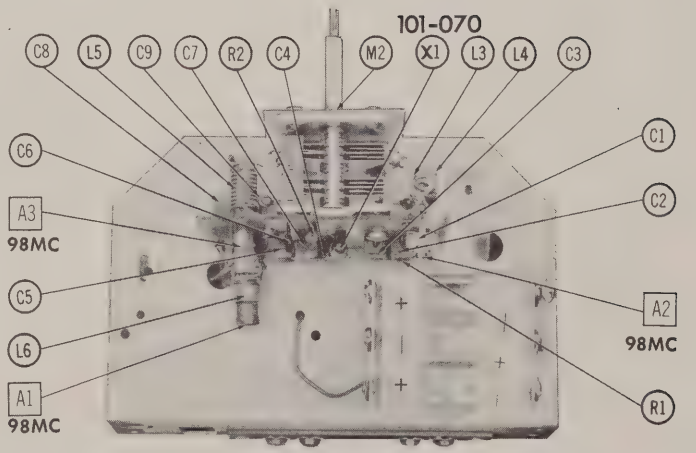
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	101-039	Dial
Knob	100-376-3	Selector Switch
Knob	101-087	Fine Tuning
Cabinet	500-143-4	

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors





ALIGNMENT INSTRUCTIONS

Note: This unit must be used in conjunction with an intercarrier type TV receiver having a 40MC IF system.

1. Connect a signal generator to the converter antenna terminals thru a matching network for 300Ω balanced input.
2. Connect the converter output to the TV receiver antenna terminals.
3. Tune the TV receiver to Channel 3.
4. Tune the signal generator to 98MC (approx. 30% modulated). Keep the output low (approx 100 micro volts).
5. Tune the converter to 98MC. Adjust A1 for maximum signal output.
6. Reduce the generator output until background noise overrides the signal.
7. Adjust A2 for maximum output. Repeat step 6.
8. Adjust A3 for maximum output while rocking converter tuning.

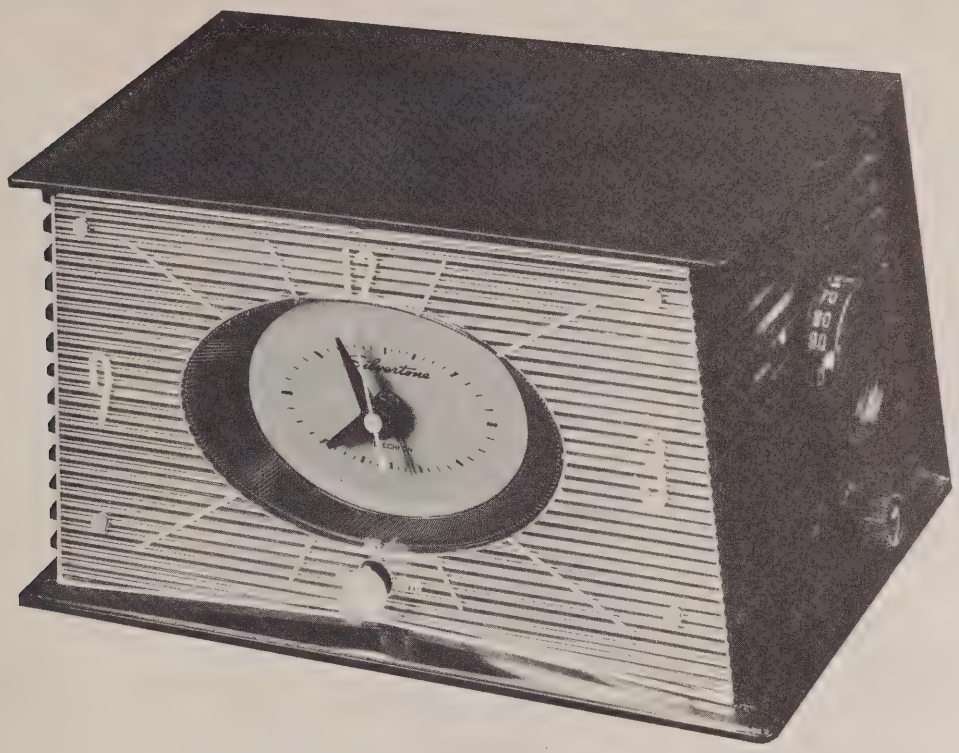
PHOTOFACT* Folder

*TRADE MARK

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

SILVERTONE MODELS 8017A, 8018A, 8019, 8020 (Ch. 528.53030, 528.53200)

SILVERTONE MODELS 8017A, 8018A, 8019, 8020 (Ch. 528.53030, 528.53200)



TRADE NAME	Silvertone Models 8017A, 8018A (Ch. 528.53030), 8019, 8020 (Ch. 528.53200)
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois
TYPE SET	AC Operated AM Receiver With Electric Clock
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles
RATING	.28 Amp. @ 117 Volts AC (27 Watts Without Clock)
TUNING RANGE—BROADCAST	535 - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial. Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~ Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001mfd to reduce hum modulation.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal.	"	A6	"

SILVERTONE MODELS 8017A, 8018A, 8019, 8020 (Ch. 528.53030, 528.53200)

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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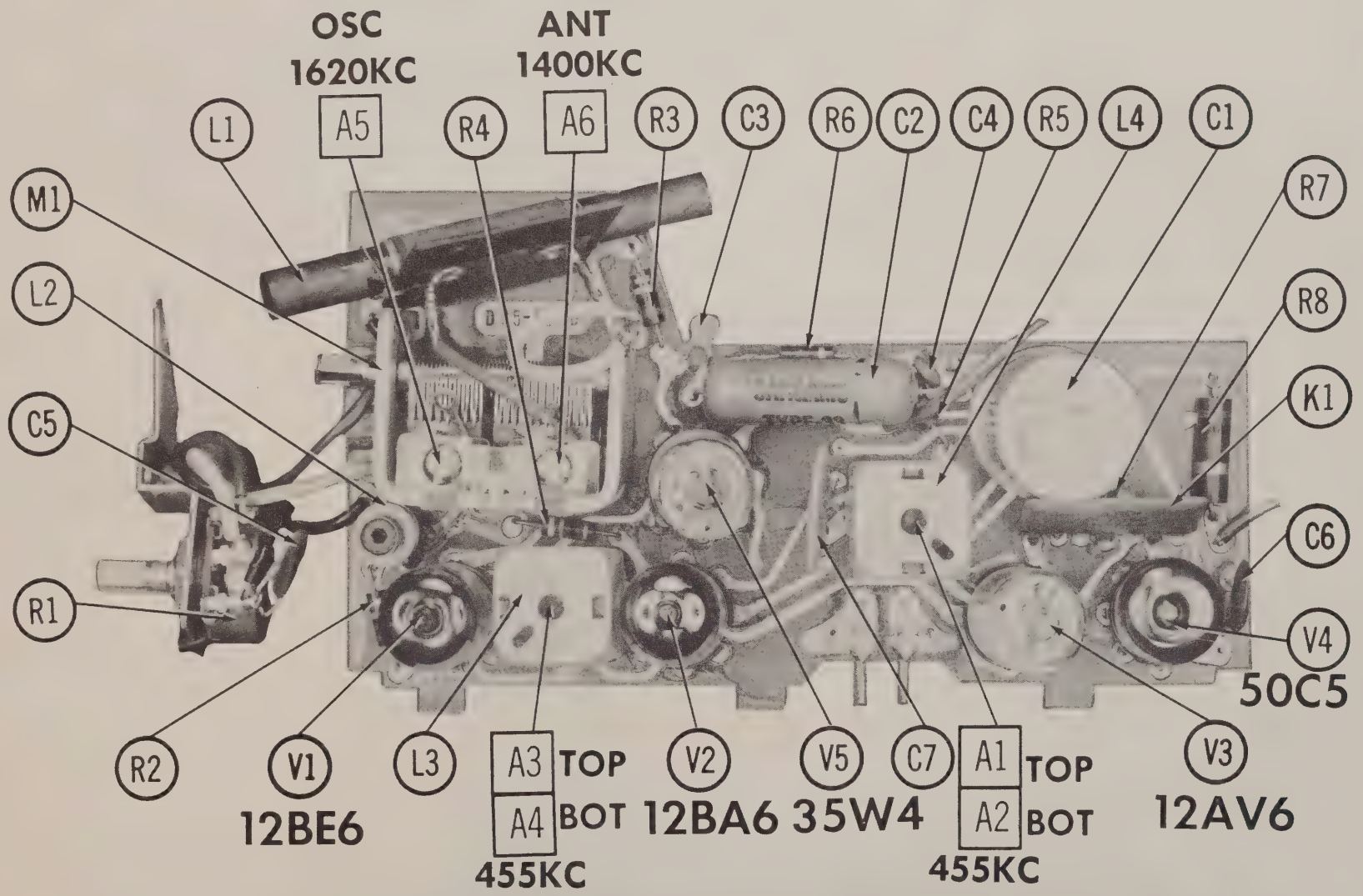


CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det. - AVC - AF Amp.	12AV6	

ITEM No.	USE	TYPE	NOTES
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■50	150	18-49-5	AFH2-15-05	BBRD5315	PFP231.1	TDLD-8	MTD-301	
B	▲30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.047	200	16-47328	P288N-047	DF-503	CUB2S47		GEM-4147	2TM-S47	
C3	1000		15-10217	BPD-001	DD-102	BYA10D1	ED-1000	DC521	5HK-D1	
C4	220		15-22111		D6-221	L10T22	ED-220		MS-322	10%
C5	5000		15-50217	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C6	6000		15-60216							
C7	20000		15-20317	BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg	½	24-263-0	B-70	A47-1meg-Z	Q13-137	U53	Volume Note 1
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

Note 1. Part #24-288-0 used in Chassis 528. 53200.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		SILVERTONE PART No.	NOTES
	OHMS	WATT		
R2	22K		60-22301	
R3	100K		60-10401	
R4	47Ω		60-47001	
R5	47K		60-47301	

ITEM No.	RATING		SILVERTONE PART No.	NOTES
	OHMS	WATT		
R6	2.2meg		60-22501	
R7	120Ω		60-12101	
R8	1000Ω	1	60-10211	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1900Ω	3-4Ω	80-1-1 ①							① Used in Models 8017A, 8018A
			80-36-1 ②							② Used in Models 8019, 8020

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	33-260-4 ①	4A07	① Includes T1. Models 8017A, 8018A
	4"	PM	3-4Ω	33-327-4 ②		② Includes T1. Models 8019, 8020

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		SILVERTONE PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loop Stick	82-118-0					Note 1
	Loop Ant.	82-126-1					Note 2
L2	Osc. Coil	10-30-4					
L3	Input IF	10-73-2	16-6780	BC-356	13-PC9	RF-4	
L4	Output IF	10-72-2	16-6780	BC-357	13-PC10	RF-4	

Note 1. Used in Chassis 528. 53030. Note 2. Used in Chassis 528. 53200, includes cabinet back.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SILVERTONE PART No.	REPLACEMENT DATA
K1	Audio Coup. Net.	5000mmf, 5000mmf, 250mmf, 220mmf, 10meg, 470K, 470K	13-14-3	

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M1	Tuning Cap.	19-55-2	2 Gang, Chassis 528. 53030
	Tuning Cap.	19-65-2	2 Gang, Chassis 528. 53200 (Ant. 33-365mmf)
M2	Clock	59-101	Models 8017A, 8018A
	Clock	59-109	Models 8019, 8020

CABINETS & CABINET PARTS

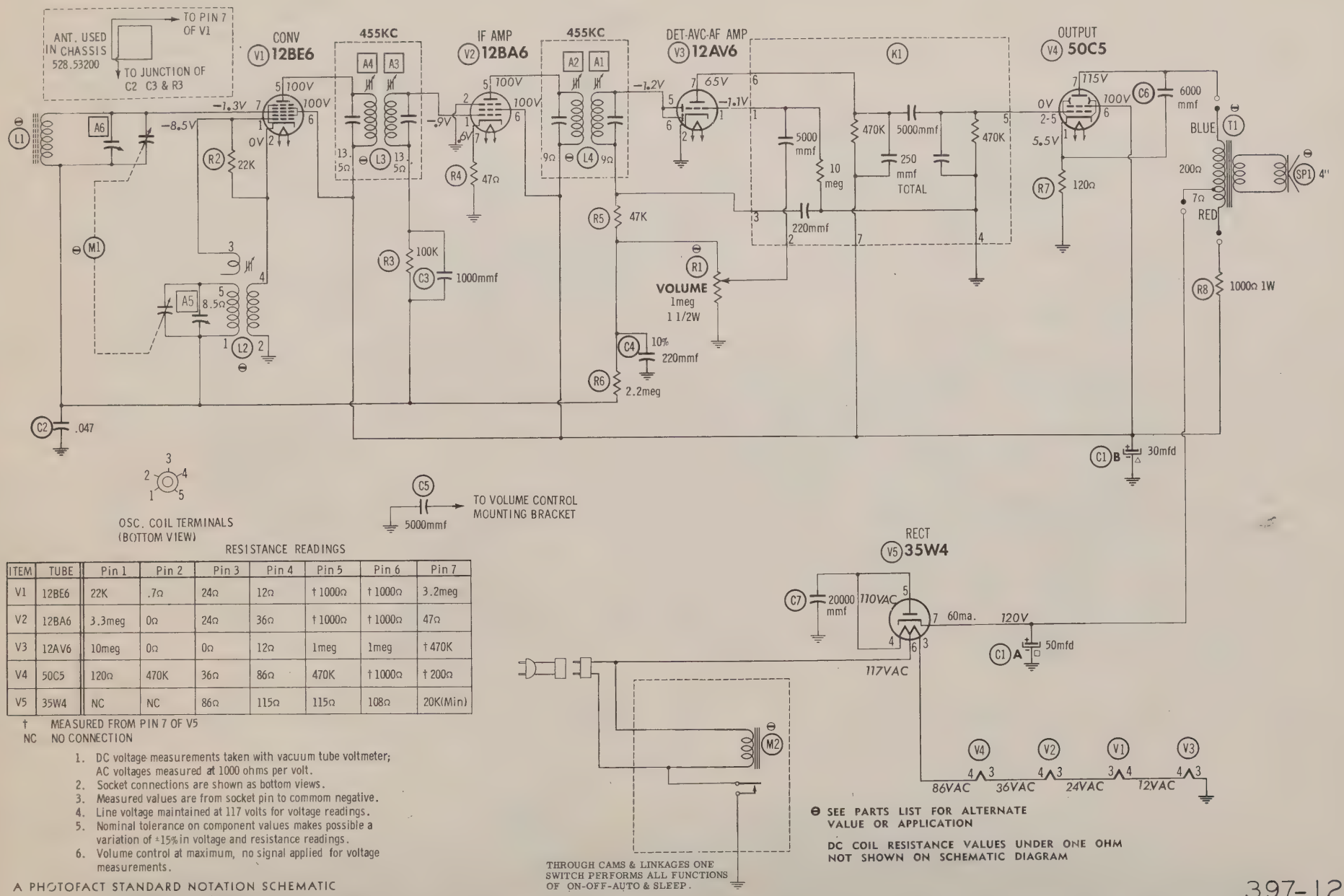
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	52-650-0	Clock, Models 8017A & 8018A
Knob	52-784-0	Clock, 2 Used, Models 8019 & 8020
Knob	52-786-0	Tuning, Model 8017A
Knob	52-787-0	Tuning, Model 8018A
Knob	52-933-0	Tuning, Models 8019 & 8020
Knob	52-649-0	Volume, Model 8017A
Knob	52-778-0	Volume, Model 8018A
Knob	52-932-0	Volume, Models 8019 & 8020
Cabinet	42-12-1	Brown, Model 8017A
Cabinet	42-13-1	Ivory, Model 8018A
Cabinet	42-36-1	Brown, Model 8019
Cabinet	42-37-1	Ivory, Model 8020

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.7Ω	24Ω	12Ω	†1000Ω	†1000Ω	3.2meg
V2	12BA6	3.3meg	0Ω	24Ω	36Ω	†1000Ω	†1000Ω	47Ω
V3	12AV6	10meg	0Ω	0Ω	12Ω	1meg	1meg	†470K
V4	50C5	120Ω	470K	36Ω	86Ω	470K	†1000Ω	†200Ω
V5	35W4	NC	NC	86Ω	115Ω	115Ω	108Ω	20K(Min)

† MEASURED FROM PIN 7 OF V5
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to commom negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

PHOTOFACT* Folder

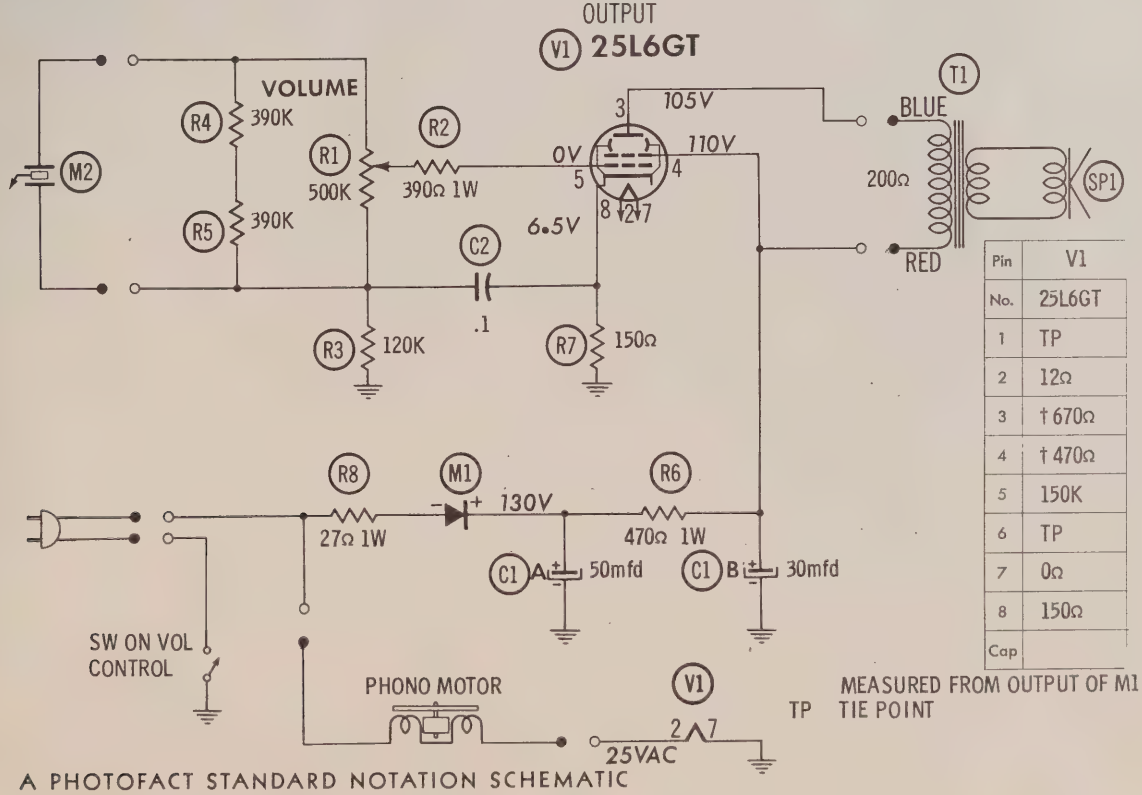
*TRADE MARK

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

SONIC MODEL 410

SONIC
MODEL 410

TRADE NAME	Sonic Model 410
MANUFACTURER	Sonic Industries, Inc., 19 Wilbur St., Lynbrook, N. Y.
TYPE SET	AC Operated Phono Amplifier With 3 Speed Manual Record Player
TUBES (One)	Type 25L6GT Output
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .34 Amp. @ 117 Volts AC (33 Watts With Motor)



Pin No.	V1 25L6GT
1	TP
2	12Ω
3	†670Ω
4	†470Ω
5	150K
6	TP
7	0Ω
8	150Ω
Cap	

MEASURED FROM OUTPUT OF M1
TP TIE POINT

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Howard W. Sams & Co., Inc. 1958

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SET 397 FOLDER 13

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Output	25L6GT	

ITEM No.	USE	TYPE	NOTES

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SONIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	150		PRS150V5030	BBRD5315	TCD497	TDLD-8	MTD-301	TVA-2450
B	30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	SONIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.1	200		P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SONIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	500K	½	VC-102					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		SONIC PART No.	NOTES
	OHMS	WATT		
R2	390Ω	1		
R3	120K			
R4	390K			

ITEM No.	RATING		SONIC PART No.	NOTES
	OHMS	WATT		
R5	390K			
R6	470Ω	1		
R7	150Ω			
R8	27Ω	1		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SONIC PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2500Ω	3-4Ω	25A1-A	Z1101	A-3025	A-3332	24S53	S-12X	

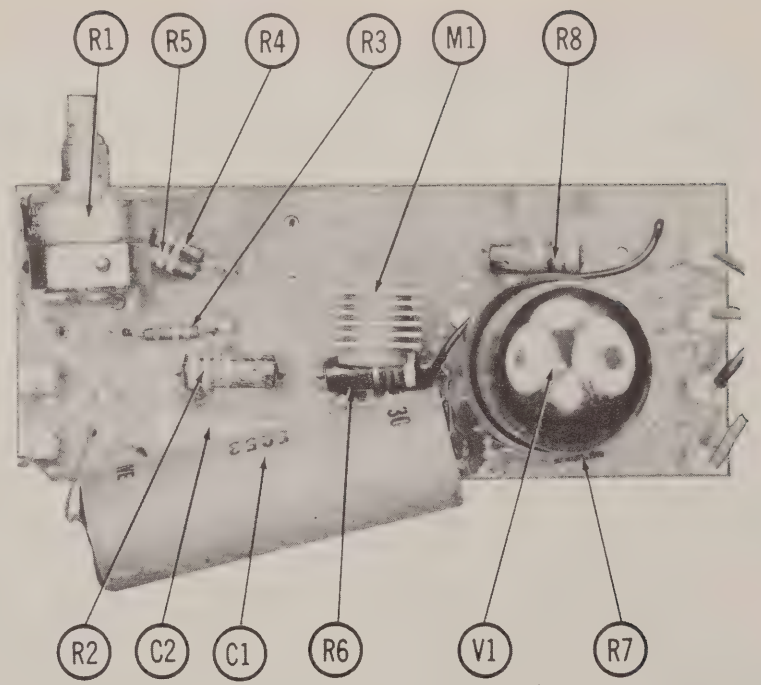
SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SONIC PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω		4A07	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	SONIC PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.05IA		1002A	RS065	65	

CHASSIS—TOP VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	SONIC PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M2		28 * P-22	N4-2(J)			* Tone arm complete with cartridge.

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	SONIC PART No.	JENSEN PART No.	WALCO PART No.	
M3		* J-152 or † J-252 or ♦ J-252D	* WA400-2 or † WS400-2 or ♦ W-400AGD	* Metal † Jewel ♦ Diamond

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT* Folder

*TRADE MARK

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

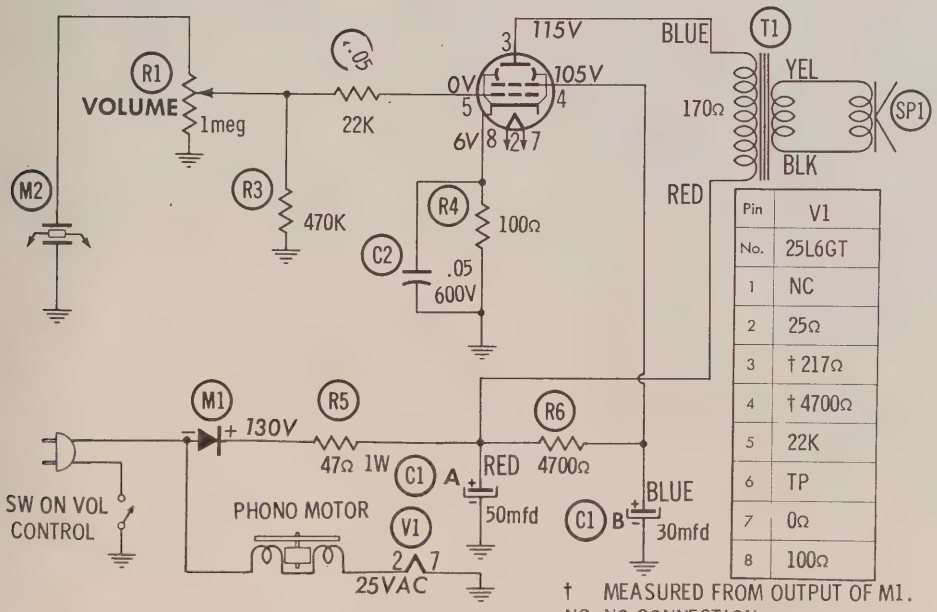
STEELMAN MODEL 3S8

STEELMAN MODEL 3S8

TRADE NAME	Steelman Model 3S8
MANUFACTURER	Steelman Phono & Radio Co., Inc., 12-30 Anderson Ave., Mount Vernon, N.Y.
TYPE SET	AC Operated Phono Amplifier With 3 Speed Manual Record Player
TUBES (One)	Type 25L6GT Output
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .34 Amp. @ 117 Volts AC (34 Watts With Motor)

STEELMAN MODEL 3S8

OUTPUT
V1 25L6GT



Pin No.	V1 25L6GT
1	NC
2	25Ω
3	† 217Ω
4	† 4700Ω
5	22K
6	TP
7	0Ω
8	100Ω

† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION.
TP TIE POINT.

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Howard W. Sams & Co., Inc. 1958

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H327

SET 397 FOLDER 14

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Output	25L6GT	

ITEM No.	USE	TYPE	NOTES

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	STEELMAN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	150		PRS150V5030	BBRD5315	WD210	TDLD-8	FMD-301	TVA-2450
B	30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	STEELMAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.05	600		P688N-05	DF-503	CUB6S5		GEM-615	6TM-S5	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	STEELMAN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg	½	360081	B-70-S	A47-1meg-Z	Q13-137	U53	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	Not Req.	US-26	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		STEELMAN PART No.	NOTES
	OHMS	WATT		
R2	22K			
R3	470K			
R4	100Ω			

ITEM No.	RATING		STEELMAN PART No.	NOTES
	OHMS	WATT		
R5	47Ω	1		
R6	4700Ω			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	STEELMAN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2200Ω	3-4Ω	430221	Z1101	A-3025	AU-605	A-3332	24S53	S-12X	

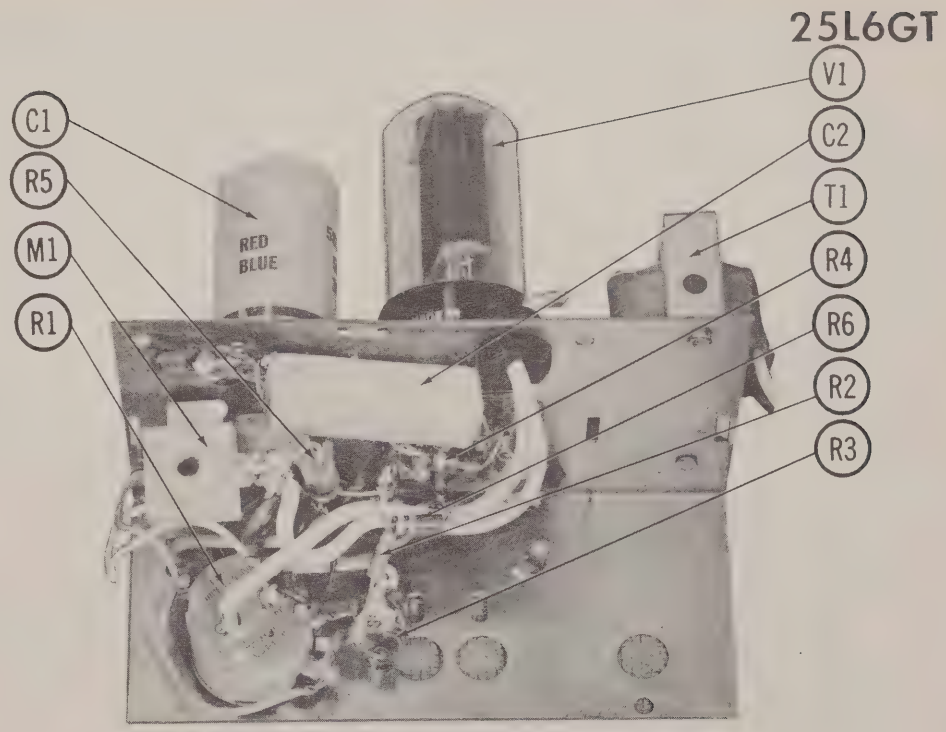
SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	STEELMAN PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	404012	4A07	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	STEELMAN PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.059A		1003A①	RS-065Q ①	75 ① M150 ②	① Selenium type. ② Silicon type.

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	STEELMAN PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M2		28	N4-2(J)			

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	STEELMAN PART No.	JENSEN PART No.	WALCO PART No.	
M3		*J-152 or †J-252 or ♦J-252D	*WA400-2 or †WS400-2 or ♦W-400AGD	* Metal † Jewel ♦ Diamond

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

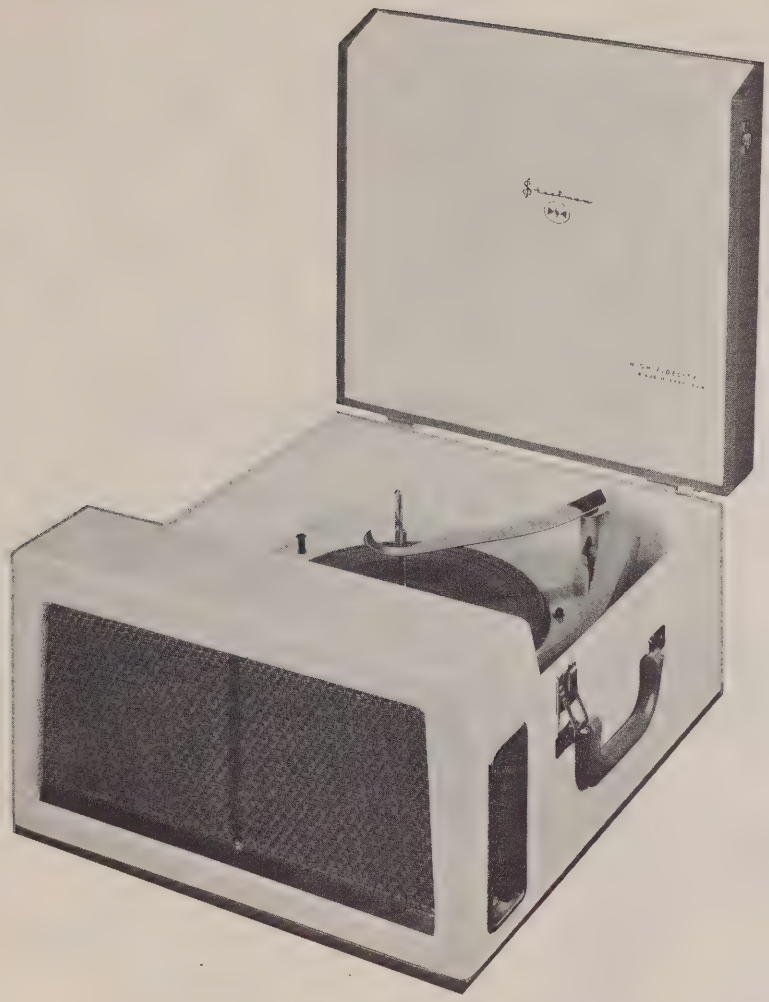
PHOTOFACT* Folder

*TRADE MARK

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

STEELMAN
MODELS 4A21, 4A22

STEELMAN
MODELS 4A21, 4A22



STEELMAN
MODELS 4A21, 4A22

TRADE NAME	Steelman Models 4A21, 4A22
MANUFACTURER	Steelman Phono & Radio Co., Inc., 12-30 Anderson Ave., Mt. Vernon, N. Y.
TYPE SET	AC Operated Phono Amplifier With 4 Speed Automatic Record Changer
TUBES (Three)	Types 12AU6 AF Amplifier, 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .25 Amp. @ 117 Volts AC (25 Watts Without Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER PART #300032 — SEE SIMILAR V-M MODEL 1200A — PHOTOFACT SET 353 FOLDER 16

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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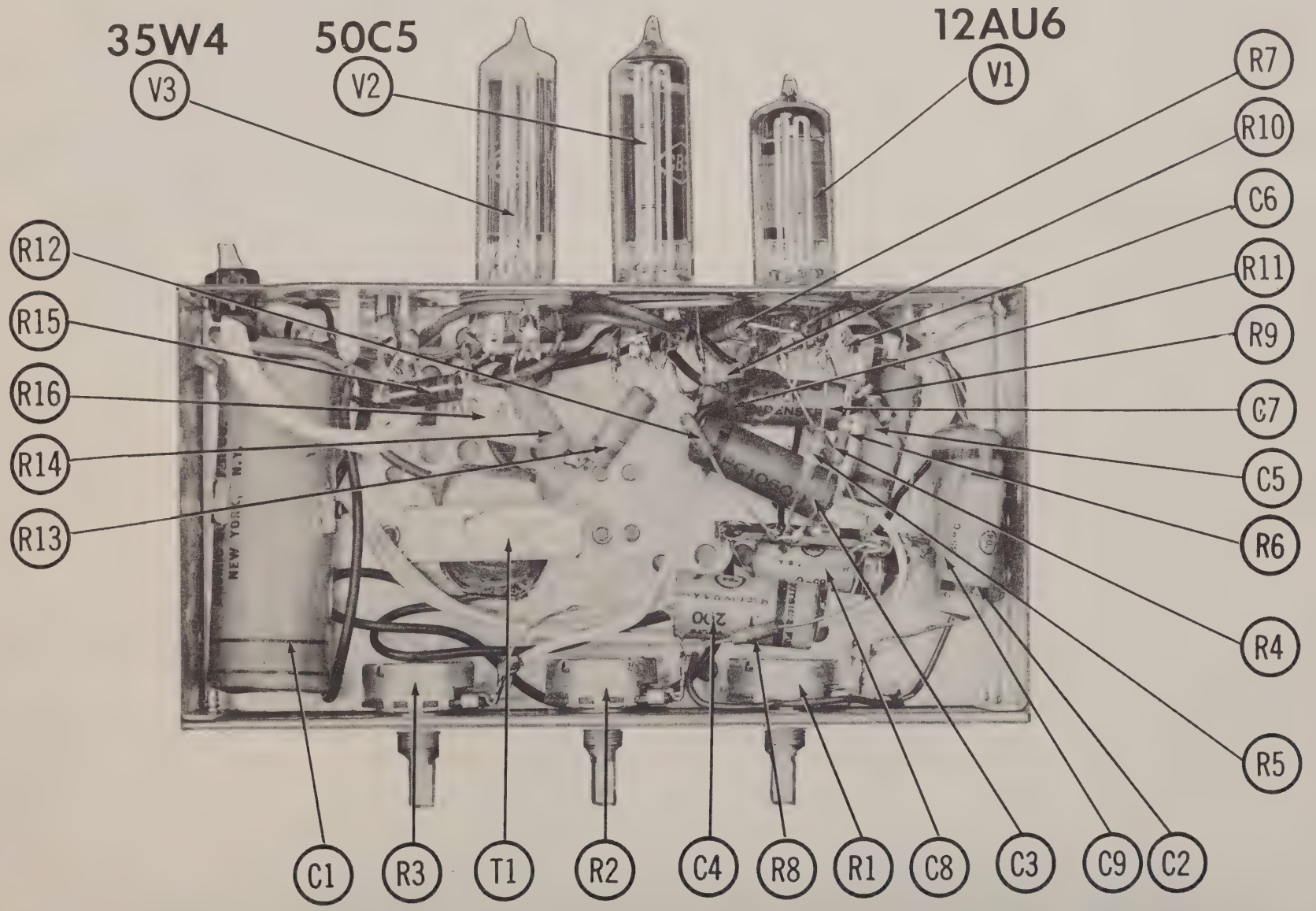
H305



CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1 V2	AF Amplifier Output	12AU6 50C5	

ITEM No.	USE	TYPE	NOTES
V3	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	STEELMAN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	80	150	583024	PRS150V8040	BBRT84215	TCT3117	TDLT-7	FMT-339	TVA-3455
B	40	150		20					
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	STEELMAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.05	200		P288N-05	DF-503	CUB4S5		GEM-415	2TM-S5	
C3	.01	600		P688N-01	D6-103	CUB6S1	GP-10000	GEM-611	6TM-S1	①
C4	.1	200		P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C5	.005	600		P688N-005	D6-502	CUB6D5	GP-5000	GEM-625	6TM-D5	②
C6	220			BPD-00022	DD-221	L10T22	ED-220	UC-5322	5GA-T22	③
C7	.01	600		P688N-01	D6-103	CUB6S1	GP-10000	GEM-611	6TM-S1	④
C8	.05	200		P288N-05	DF-503	CUB4S5		GEM-415	2TM-S5	
C9	.1	400		P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	

① Some versions may use .001mfd in this application.
② Some versions may use .01mfd in this application.
③ Model 4A21 use 150mmf in this application.
④ Model 4A22 may use .007mfd in this application. Model 4A21 use .005mfd in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	STEELMAN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	3.25meg	½	360320	B-862	A47-4meg-Z	Q13-140	U57	Loudness
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	5meg	½	360330	B-88	A47-5meg-Z	Q13-141	U65	Bass (Note 1)
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	7500Ω	½	360225	B-13	A47-7500-S	Q11-115	U20	Treble
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

Note 1. Bass control not used in Model 4A21

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		STEELMAN PART No.	NOTES
	OHMS	WATT		
R4	4.7meg			
R5	470K			
R6	4.7meg			
R7	3300Ω			
R8	91K			Note 1
R9	4700Ω			Note 2

ITEM No.	RATING		STEELMAN PART No.	NOTES
	OHMS	WATT		
R10	470K			
R11	150Ω			
R12	2200Ω			
R13	150Ω	1		Note 3
R14	150Ω	1		Note 3
R15	22Ω	1		
R16	125Ω	5	510005	Note 4

Note 1. Some Model 4A22 use 100K in this application. Not used in Model 4A21.
Note 2. Some versions may use 10K in this application.
Note 3. When R13 is 330Ω 2W, R14 is not used.
Note 4. Some versions use a 130Ω 10W in this application.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	STEELMAN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2500Ω	1.9Ω	430240 ①	Z1001 ②		AU-605				① Part #430201 used in Model 4A21 ② Drill new mounting hole.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	STEELMAN PART No.	QUAM PART No.	
SP1	5"	PM	3-4Ω	405005 ①②	5A15 ①	① Parallel and phase ② Used in Model 4A22 ③ Used in Model 4A21
SP2	5"	PM	3-4Ω	405005 ①②	5A15 ①	
	4" X 6"	PM		407001 ③		

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	STEELMAN PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M1	322517 (TO-400-0V)	118-TS	N8-1 & N8-3	56	PT-1	Model 4A22
	322503 (TO-222FF)	420-TS	N8-1 & N8-3	56	PT-1	Model 4A21

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	STEELMAN PART No.	JENSEN PART No.	WALCO PART No.	
M2	329307 (N-5304-N) (78RPM)	† CRA-55 or ♦ CRA-55D	† W64S or † W64D	† Jewel ♦ Diamond
	329107 (N-5304-L) (LP)	† CRA-55LP or ♦ CRA-55LPD	† W64MGS or ♦ W64MGD	

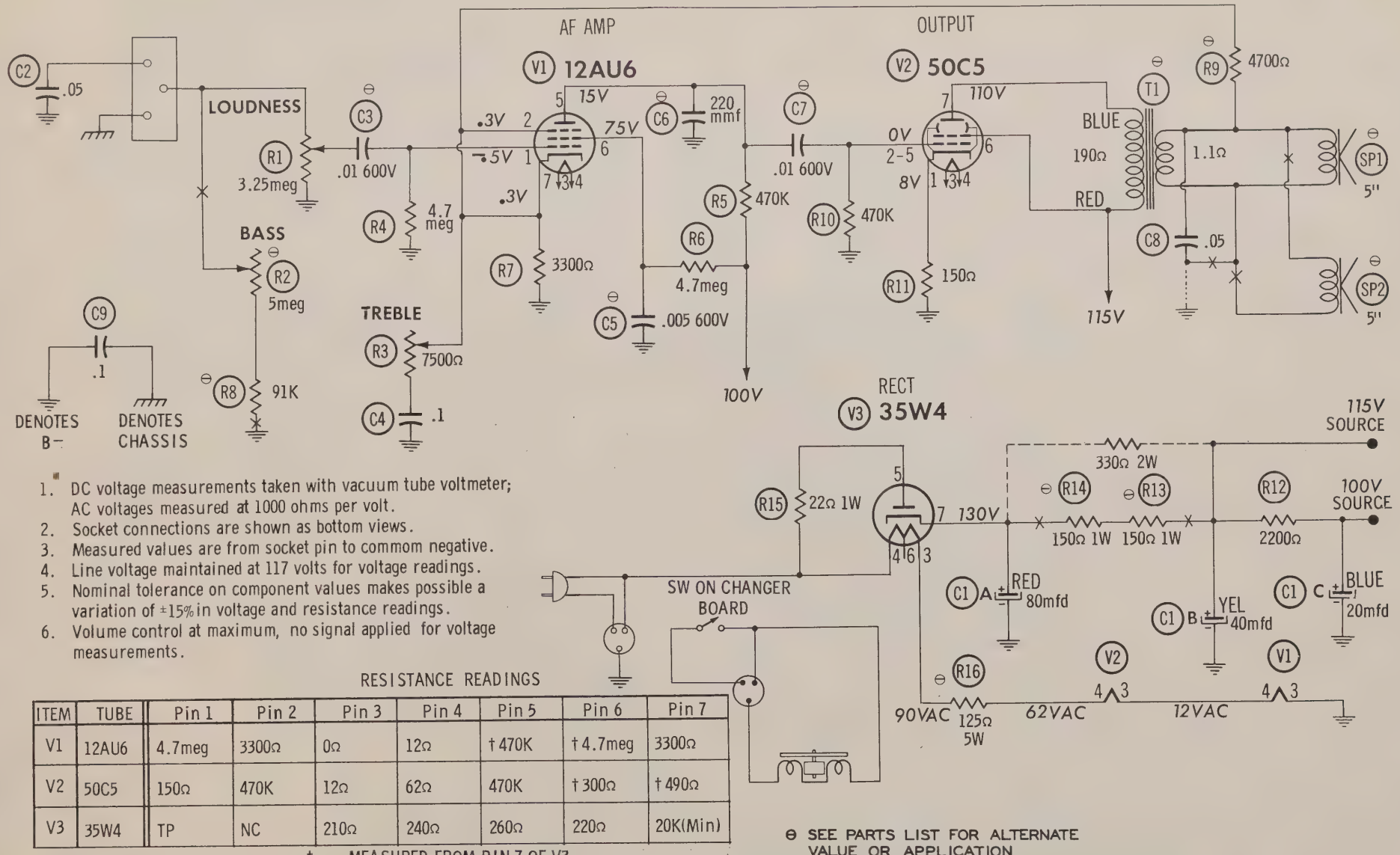
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	270400	Loudness, Model 4A22
Knob	270403	Loudness, Model 4A21
Knob	270401	Treble, Model 4A22
Knob	270404	Treble, Model 4A21
Knob	270402	Bass, Model 4A22
Cabinet	230810	Rust & Beige, Model 4A22
Cabinet	230620	Charcoal & White, Model 4A21

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to commom negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12AU6	4.7meg	3300Ω	0Ω	12Ω	†470K	†4.7meg	3300Ω
V2	50C5	150Ω	470K	12Ω	62Ω	470K	†300Ω	†490Ω
V3	35W4	TP	NC	210Ω	240Ω	260Ω	220Ω	20K(Min)

† MEASURED FROM PIN 7 OF V3
NC NO CONNECTION
TP TIE POINT

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

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PHOTOFACT* Folder

*TRADE MARK

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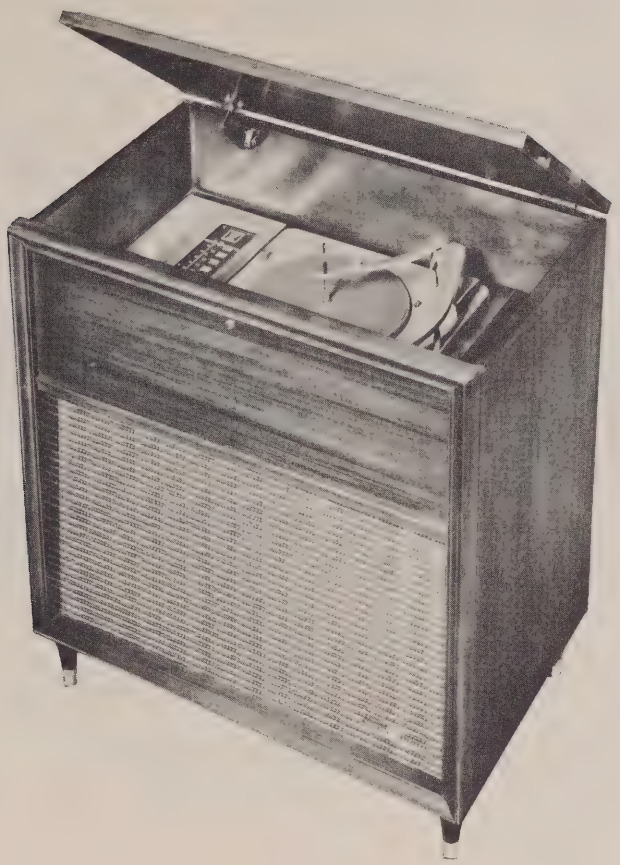
TRUETONE MODEL D5842A, D5844A

TRUETONE MODEL
D5842A, D5844A



TRUETONE MODEL
D5842A, D5844A

TRADE NAME	Truetone Models D5842A, D5844A
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo.
TYPE SET	AC Operated AM Receiver with 4 Speed Automatic Record Changer
TUBES(Eight)	Types 6BA6 RF Amplifier, 6BE6 Converter, 6BA6 IF Amplifier, 6AV6 Det.-AVC-AF Amp., 12AX7 AF Amp.-Phase Inv., (2) 6AQ5 Output 5Y3GT Rectifier
POWER SUPPLY	105-125 Volts AC-60 Cycles — RATING .56 Amp. @ 117 Volts AC (61Watts without Motor)
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	455KC (400~ Mod)	Tuning gang fully open	Across voice coil	A1, A2 A3, A4	Adjust for maximum output
2.	.1mfd	High side to pin 1 (grid) of 6BA6 (V1) Low side to chassis	1620KC	Tuning gang fully open	Across voice coil	A5	Adjust for maximum output
3.	.1mfd	High side to pin 1 (grid) of 6BA6 (V1) Low side to chassis	1400KC	Tune to 1400KC signal.	Across voice coil	A6	Adjust for maximum output while rocking tuning gang.
4.	50mmf	High side to external Ant. Terminal. Low side to chassis.	1400KC	Tune to 1400KC signal	Across voice coil	A7	Adjust for maximum output while rocking tuning gang.

FOR SERVICE INFORMATION ON RECORD CHANGER-SEE SIMILAR V-M MODEL 1200A-PHOTOFACT SET 353 FOLDER 16

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	6BA6	
V2	Converter	6BE6	
V3	IF Amplifier	6BA6	
V4	Det. -AVC-AF Amp.	6AV6	

ITEM No.	USE	TYPE	NOTES
V5	AF Amp. -Phase Inv.	12AX7	
V6	Output	6AQ5	
V7	Output	6AQ5	
V8	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	TRUETONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▬ 40	350	45X415	AFH3-43	C0340	FP376. 8	TMT-38	T-165	TVL-3785
B	■ 40	350							
C	▲ 10	350							
C2	5	10VNP	45X426	NP-PRS50V4	BBR10-25 † BBR10-25	TC22 † TC22	TD-10-25 † TD-10-25	MT-0210 † MT-0210	R2316 *

† Connect negative leads together

* Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

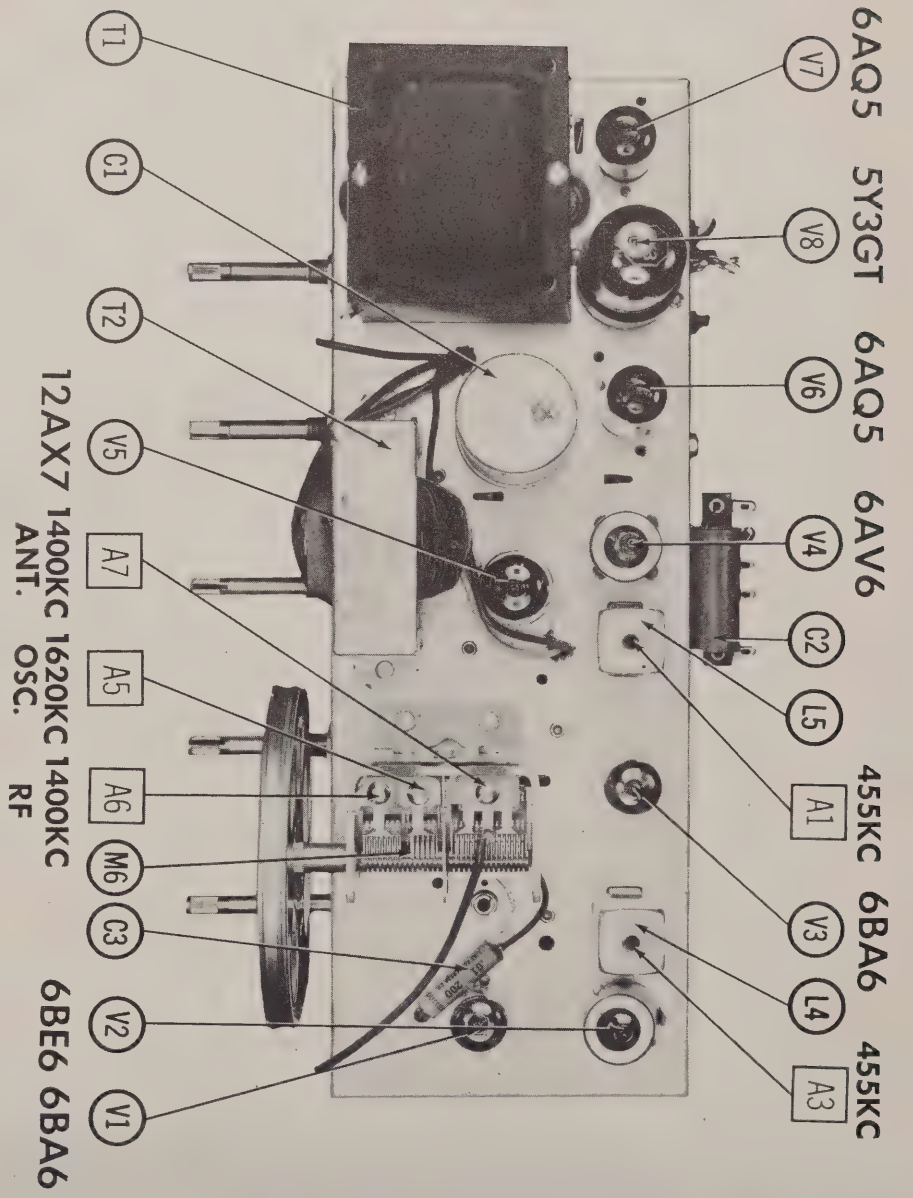
ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	.01	200		P288N-01	D6-103	CUB2S1	GP-10000	GEM-411	4TM-S1	
C4	.047	200		P288N-047	DF-503	CUB2S47		GEM-4147	2TM-S47	
C5	.022	400		P488N-022	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C6	470		47X622	SI470	D6-471	LT6T47	GP-470	UC-5347	5GA-T47	
C7	33		47X612	SI33	D6-330	LT6Q33	GP-33	UC-5433	5GA-Q33	
C8	.047	400		P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	
C9	.047	400		P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	
C10	.047	200		P288N-047	DF-503	CUB2S47		GEM-4147	4TM-S47	①
C11	.01	200		P288N-01	D6-103	CUB2S1	GP-10000	GEM-411	4TM-S1	
C12	47		47X603	SI47	D6-470	LT6Q47	GP-47	UC-5447	5GA-Q47	
C13	470		47X622	SI470	D6-471	LT6T47	GP-470	UC-5347	5GA-T47	
C14	180		47X564	1464-00018	D6-181	22R5T18	ED-180		MS-318	10%
C15	.022	400		P488N-022	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C16	330		47X624	SI330	D6-331	LT6T33	GP-331	UC-5333	5GA-T33	
C17	.0047	600		P688N-0047	D6-472	CUB6D47	GP-472	GEM-6247	6TM-D47	
C18	.0047	600		P688N-0047	D6-472	CUB6D47	GP-472	GEM-6247	6TM-D47	
C19	1500			SI1500	D6-152	LT6D15	GP-1500	UC-5215	5GA-D15	
C20	.0022	600		P688N-0022	D6-222	CUB6D22	GP-2200	GEM-6222	6TM-D22	
C21	.022	400		P488N-022	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C22	.022	400		P488N-022	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	

① Some versions may use .0047mfd in this application

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2meg	½	36X396	BT-79	A47F6-2meg	Q13-139X	UT-454	Loudness, Tap@ 500K
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	500K	½	40X418	B-60-S	A47-500K-Z	Q13-133	U48	Treble
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KB-1	SWE-12	76-1	US-26	
R3A	1meg	½	40X419	B-70	A47-1meg-Z	Q13-137	U53	Bass
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	TRUETONE PART No.	NOTES
R4	3.3meg			
R5	47K			
R6	330K			
R7	100K			
R8	100Ω			
R9	33K	1		
R10	39K			
R11	47Ω			
R12	2.2meg			
R13	33K	1		
R14	330Ω			
R15	100K			
R16	10meg			
R17	270K			
R18	82K			
R19	470K			
R20	33K			
R21	180K			
R22	100K			
R23	120K			
R24	2000Ω 5%			
R25	470Ω			
R26	7500Ω 5%			
R27	220K 5%			
R28	100K			
R29	470Ω			
R30	120K			
R31	220K			
R32	220Ω	2		
R33	1000Ω	1		
R34	6800Ω			

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V .56A	530VCT @.078A	5V @ 2A	6.3V @2.2A	53X360	P9205①	P-3051①	PM8403	22R01①	R-8B①

① Drill New Mounting Holes

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	9000Ω CT	3-4Ω	51X187						

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA TRUETONE PART No.	QUAM PART No.	NOTES
SP1	12"	PM	3-4Ω	12A546 ①	12A4A①	①Parallel & Phase
SP2	8"	PM	12Ω	12A545 ①	8A1Z12①	
SP3	5"	PM	9Ω	12A544	5A1Z9T	

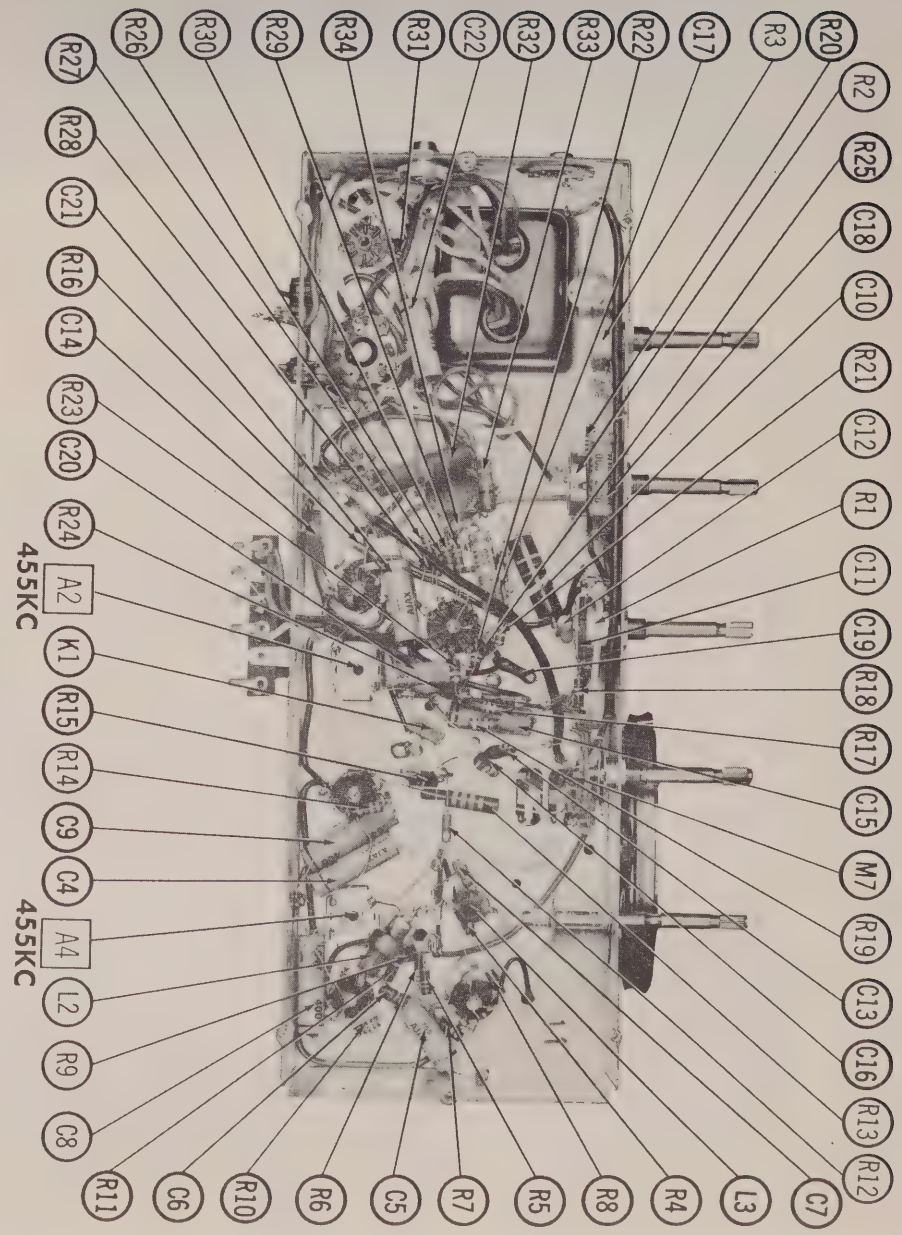
COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA TRUETONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Loop Ant.	9A2376				Includes Cabinet Back
L2	RF Coil	9A2289				
L3	Osc Coil	9A2113	14-1077	BC-393	71-Osc	
L4	Input IF	9A2392	16-6758	BC-352	12-C1	
L5	Output IF	9A2393	16-6758	BC-353	12-C2	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	TRUETONE PART No.	REPLACEMENT DATA
K1	Diode RF Filter	50mmf, 50mmf 47K	76X1	Aerovox PA-99 Centralab PC-52 Cornell-Dubilier 111TM3 Erie 1403-03 Sprague D-3

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	TRUETONE PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M1	2TS	55T or 81-TB	GD-J	56	PT-2	

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	TRUETONE PART No.	JENSEN PART No.	WALCO PART No.	
M2	9987S	† S-66 or † ♦ S-66SD or † S-66D	† W-75TPS or † ♦ W-75DS or ♦ W-75TPD	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M3	Jewel Lamp		#15
M4	Pilot Lamp		#47
M5	Pilot Lamp		#47
M6	Tuning Cap	14A299	3 Gang (Ant. 28-515mmf, RF 12-245mmf, Osc. 12-105mmf)
M7	Switch	2A473	Selector (Rotary, Wafer Type)

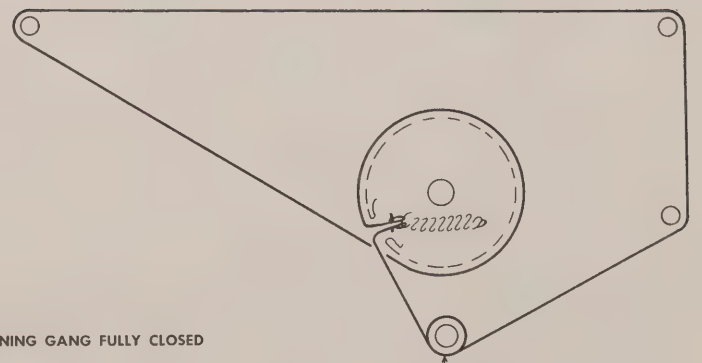
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

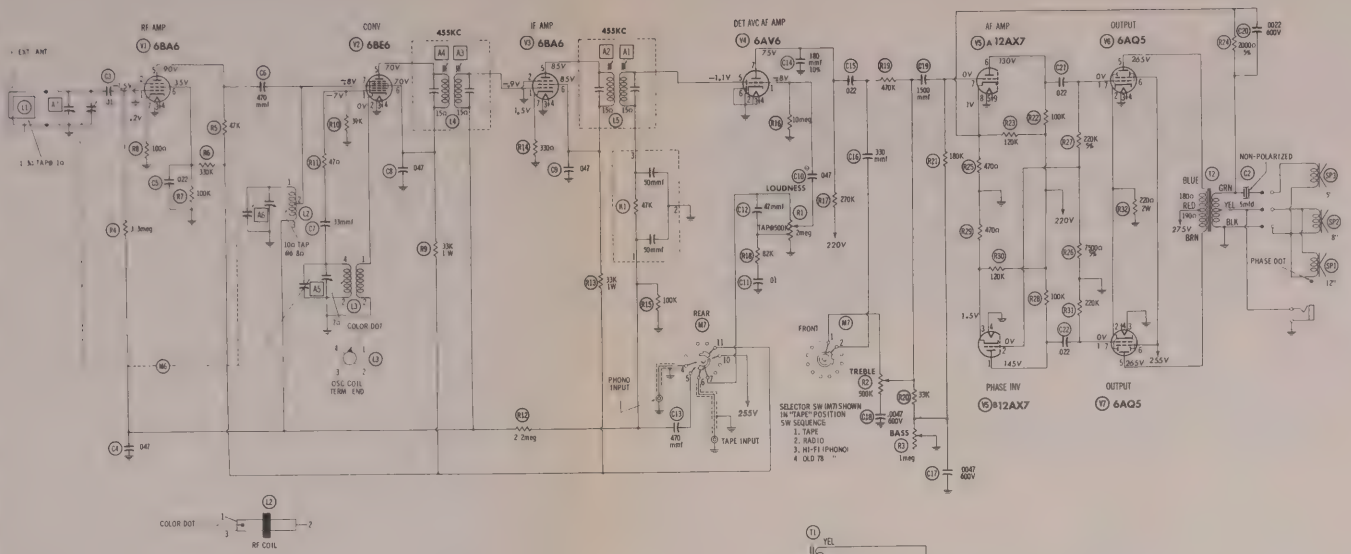
NAME	PART NO.	DESCRIPTION
Knob	10A869-2	Tuning
Knob	10A867-2	On-Off-Treble, Bass, Loudness, Function Switch
Dial Glass	58X801	
Dial Pointer	15X278-2	

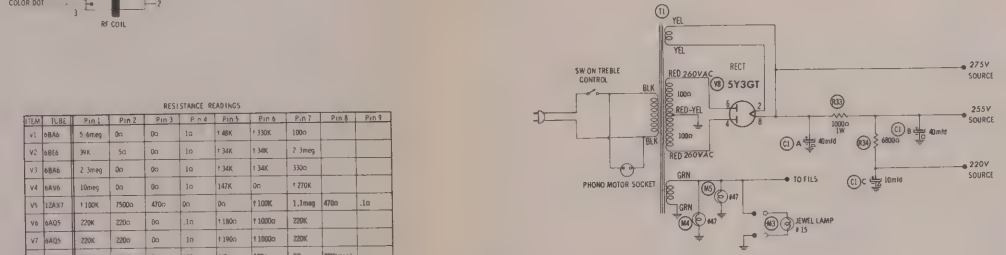
WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)



DIAL CORD STRINGING





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BA6	5.6meg	0Ω	0Ω	1Ω	†48K	†330K	100Ω		
V2	6BE6	39K	5Ω	0Ω	1Ω	†34K	†34K	2.3meg		
V3	6BA6	2.3meg	0Ω	0Ω	1Ω	†34K	†34K	330Ω		
V4	6AV6	10meg	0Ω	0Ω	1Ω	147K	0Ω	†270K		
V5	12AX7	†100K	7500Ω	470Ω	0Ω	0Ω	†100K	1.3meg	470Ω	.1Ω
V6	6AQ5	220K	220Ω	0Ω	.1Ω	†180Ω	†1000Ω	220K		
V7	6AQ5	220K	220Ω	0Ω	1Ω	†190Ω	†1000Ω	220K		
V8	5Y3GT	NC	20K(min)	TP	100Ω	NC	100Ω	TP	20K(min)	

ALL MEASUREMENTS TAKEN IN "RADIO" POSITION
† MEASURED FROM PIN 8 OF V8
NC NO CONNECTION
TP TIE POINT

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

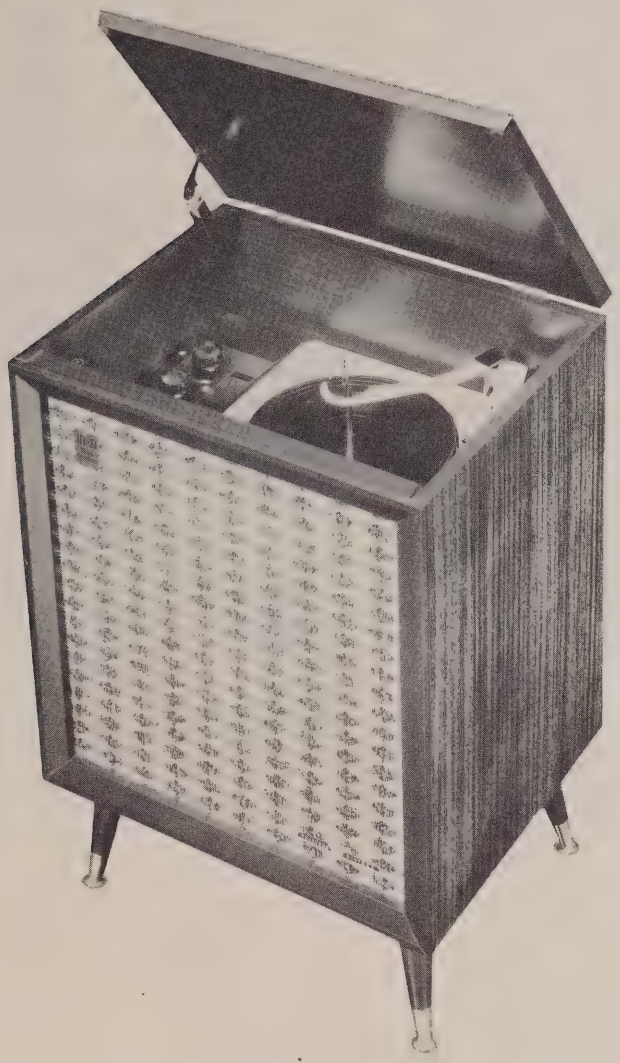
PHOTOFACT* Folder

*TRADE MARK

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

TRUETONE MODELS D5892, D5892A, D5894, D5894A

TRUETONE MODELS D5892, D5892A, D5894, D5894A



TRUETONE MODELS D5892, D5892A, D5894, D5894A

TRADE NAME	Truetone Models D5892, D5892A, D5894, D5894A
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City 8, Mo.
TYPE SET	AC Operated Phono Amplifier With 4 Speed Automatic Record Changer
TUBES (Three)	Types 12AX7 AF Amp. -Phase Inv., (2) 50C5 Output
POWER SUPPLY	105-125 Volts AC-60 Cycles RATING .36 Amp. @ 117 Volts AC (31 Watts Without Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER PART #1210-14 — SEE SIMILAR V-M MODEL 1200-A — PHOTOFACT SET 353 FOLDER 16

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TRUETONE MODEL D5892A

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amp. - Phase Inv.	12AX7	
V2	Output	50C5	

ITEM No.	USE	TYPE	NOTES
V3	Output	50C5	

ELECTROLYTIC CAPACITOR

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	TRUETONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲80	150	1018	AFH4-01	D0010	FP311. 7	TMQ-1	Q-005	R2485 *
B	■40	150							
C	▲20	150							

* Non-Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.05	400	828	P488N-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C3	.1	200	804	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C4	5000		906	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C5	.1	200	804	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C6	.1	200	804	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C7	.05	400	828	P488N-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C8	2	50	830							

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	3Meg	½	401E	BT-8517	A47F3-3Meg	Q13-140	U57	Volume, Tap ② 300K ①
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	7500Ω		408G	B-15	A47-10K-Z	Q13-116	U18	Treble
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	100K		416	B-40	A47-100K-S	Q11-228	U41	Bass
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

① Tap not used

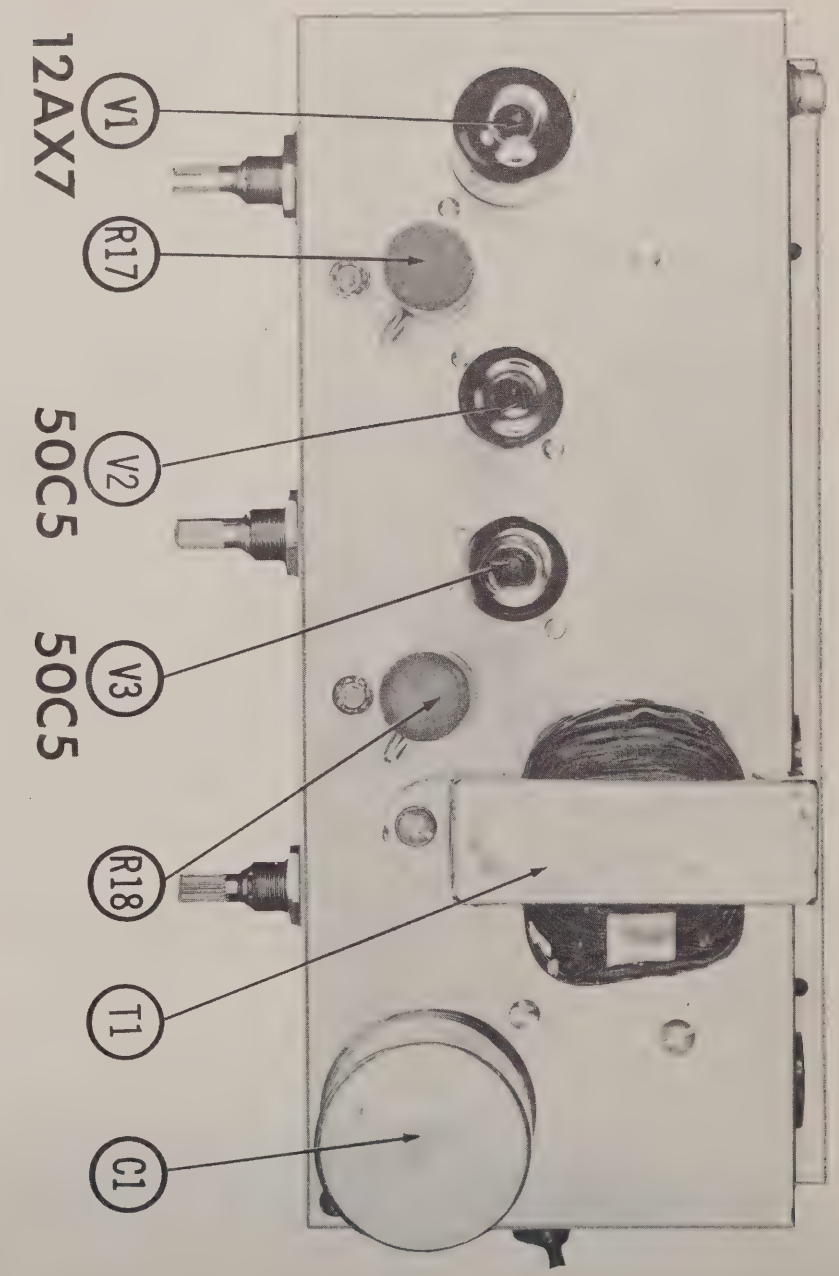
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		TRUETONE PART No.	NOTES
	OHMS	WATT		
R4	270K		529A	
R5	22K		517	
R6	270K		529A	
R7	4700Ω		519	
R8	47K		523	
R9	270K		529A	
R10	10K		522	
R11	470K		502	

ITEM No.	RATING		TRUETONE PART No.	NOTES
	OHMS	WATT		
R12	82Ω	2	628	
R13	470K		502	
R14	22K		517	
R15	100Ω	2	630	
R16	10K		522	
R17	600Ω	10	626A	
R18	56Ω	10	627A	
R19	27	1	542	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA: TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2700Ω CT	6-8Ω	1210A ①						① Alternate Part #1210B

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: TRUETONE PART No.	QUAM PART No.	NOTES
SP1	8"	PM	3-4Ω	2620 ①	8A3IR ①	① Connect in series and phase
SP2	8"	PM	3-4Ω	2620A ①	8A3IR ①	
SP3	3½"	PM	6-8Ω	2621	3A07Z7.6	

RECTIFIER

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: TRUETONE PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1	.095A	2743	1005A	RS150	150	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA: TRUETONE PART No.	ASTATIC PART No.: CARTRIDGE	ASTATIC PART No.: NEEDLE	ELECTRO-VOICE PART No.: CARTRIDGE	ELECTRO-VOICE PART No.: MOUNT	REMARKS
M2	2597	55T or 81-TB	GD	56	PT-2	

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA: TRUETONE PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M3		† A-71 or ♦† A-71SD or ♦ A-71D	† W8TPS †♦ W8DS or ♦ W8TPD	† Jewel ♦ Diamond

CABINETS & CABINET PARTS

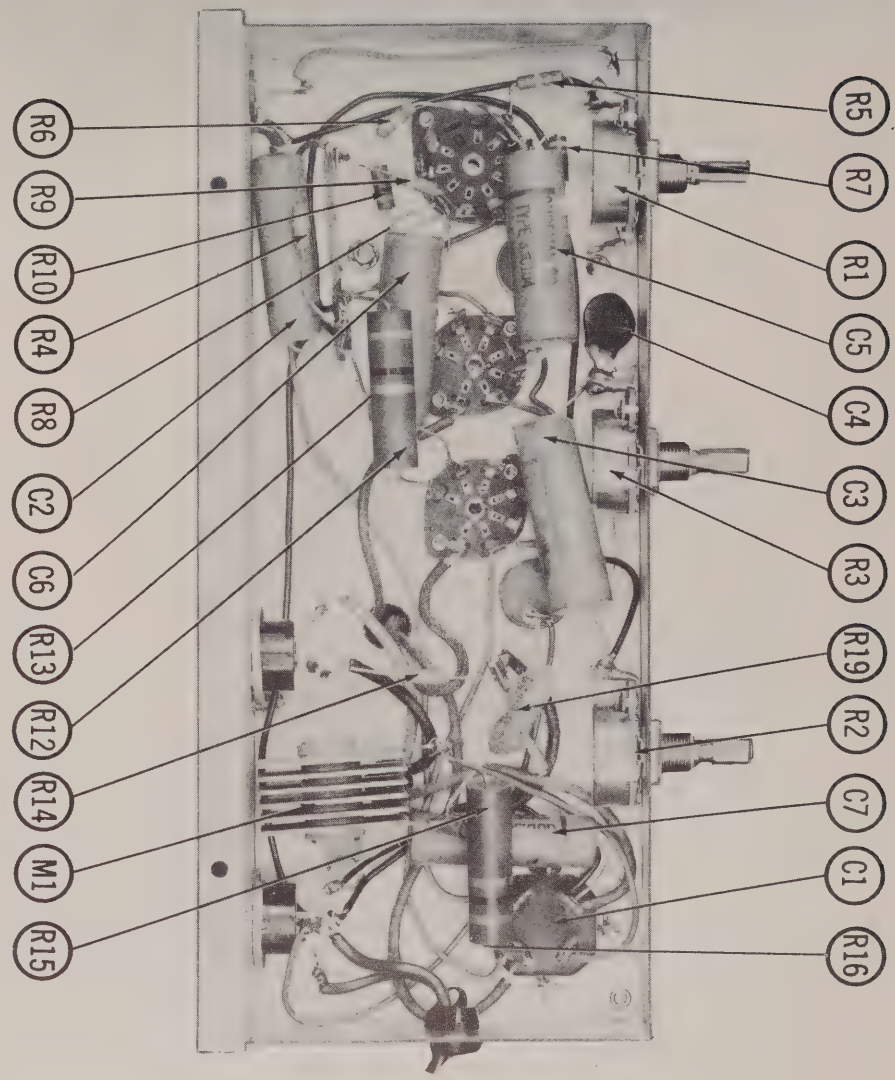
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

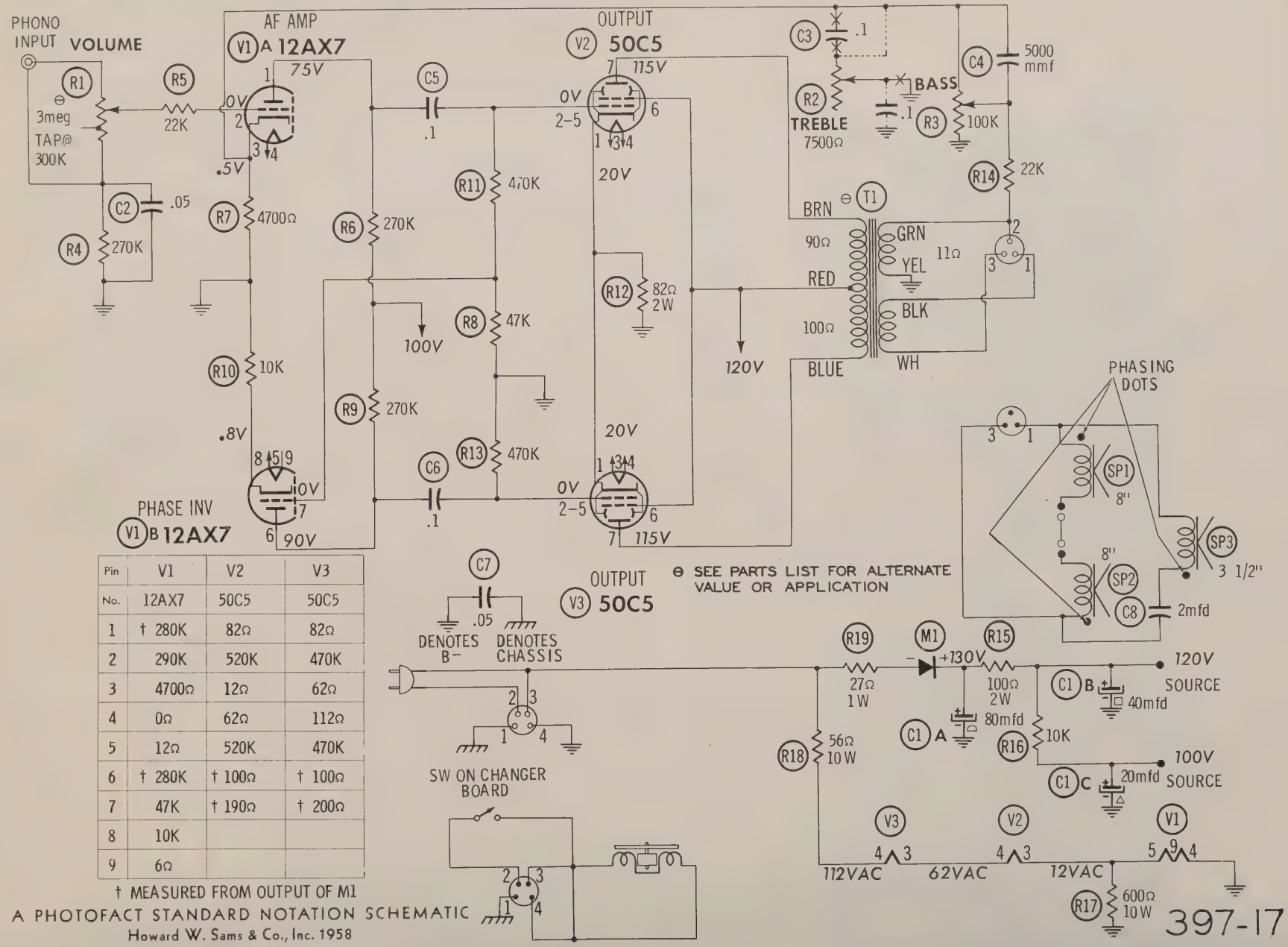
NAME	PART NO.	DESCRIPTION
Escutcheon	1792	
Knob	2426A	Volume, Bass & Treble
Cabinet	3916	Mahogany
Cabinet	3917	Blonde

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS—BOTTOM VIEW





Pin No.	V1 12AX7	V2 50C5	V3 50C5
1	† 280K	82Ω	82Ω
2	290K	520K	470K
3	4700Ω	12Ω	62Ω
4	0Ω	62Ω	112Ω
5	12Ω	520K	470K
6	† 280K	† 100Ω	† 100Ω
7	47K	† 190Ω	† 200Ω
8	10K		
9	6Ω		

† MEASURED FROM OUTPUT OF M1

A PHOTOFACT STANDARD NOTATION SCHEMATIC

Howard W. Sams & Co., Inc. 1958

397-17

PHOTOFACT* Folder

*TRADE MARK

ZENITH MODELS
A512W, A512Y (Ch. 5A02)

ZENITH MODELS
A512W, A512Y (Ch. 5A02)

ZENITH MODELS
A512W, A512Y (Ch. 5A02)

TRADE NAME	Zenith Models A512W, A512Y (Ch. 5A02)
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Avenue. Chicago 39, Illinois
TYPE SET	AC-DC Operated AM Receiver
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC — RATING .27Amp. @117 Volts AC (27 Watts)
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.5mfd	High side to pin 7 (grid) of 12BE6 (V1) Low side to B-	455KC (400% Mod)	600KC	Across voice coil	A1, A2 A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1600KC	1600KC	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	1400KC	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det. -AVC-AF Amp.	12AV6	

ITEM No.	USE	TYPE	NOTES
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	60	150	22-2894	PRS150V402020	BBRT42215	TCT3114	TDLT-3	FMT-310	R1514*
B	20	150							

* Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.047	200	22-2792	P288N-047	DF-503	CUB2S47		GEM-4147	2TM-S47	
C3	100	1000	22-5	HVD-15-100	DD-101	L10T1	HD15-100		5GA-T1	
C4	.047	200	22-2792	P288N-047	DF-503	CUB2S47		GEM-4147	2TM-S47	
C5	.047	200	22-2792	P288N-047	DF-503	CUB2S47		GEM-4147	2TM-S47	
C6	.022	200	22-2807							10%
C7	10000	1000	22-3	DAC-27		BYA10S1M			BL-S10	
C8	.047	200	22-2792	P288N-047	DF-503	CUB2S47		GEM-4147	2TM-S47	
C9	10000	1000	22-3	DAC-27					BL-S10	
C10	470	1000	22-6	HVD-15-470	DD-471	BYA10T47	HD15-470	DC30347	5GA-T47	
C11	10000	1000	22-3	DAC-27		BYA10S1M			BL-S10	
C12	10000	1000	22-3	DAC-27		BYA10S1M			BL-S10	
C13	10000	1000	22-3	DAC-27		BYA10S1M			BL-S10	
C14	.047	200	22-2792	P288N-047	DF-503	CUB2S47		GEM-4147	2TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1.5meg	½	63-4009	BT-167				Volume, Tap ⓐ 700K
B	Shaft			Not Req.				
C	Switch			KB-1 *				
R2A	1meg	½	63-3640	B-70	A47-1meg-Z	Q13-137	U53	Tone
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

*Use KR-1 on red label control only

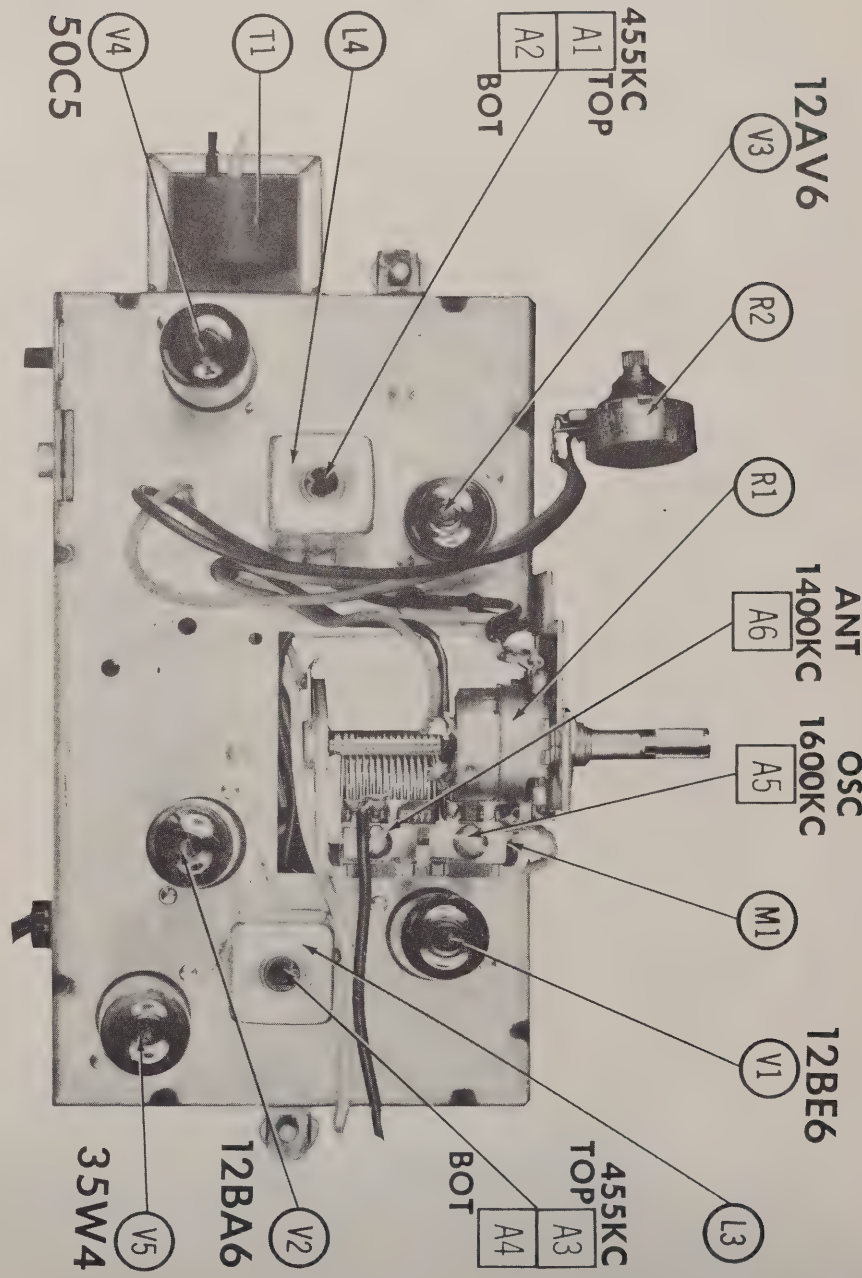
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		ZENITH PART No.	NOTES
	OHMS	WATT		
R3	2.2meg		63-1926	
R4	22K		63-1842	
R5	100Ω		63-1744	
R6	47K		63-1856	
R7	390K		63-1894	
R8	4.7meg		63-1940	
R9	1800Ω		63-1796	

ITEM No.	RATING		ZENITH PART No.	NOTES
	OHMS	WATT		
R10	33K		63-1848	
R11	470K		63-1898	
R12	470K		63-1898	
R13	150Ω		63-1750	
R14	4700Ω		63-1813	
R15	1000Ω	1	63-1574	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2300Ω	1.6Ω	95-1506	Z1006 ①	A2902 ①	AU-605	A-3849 ①	24S48		①Drill new mounting hole

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ZENITH PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	49-809 ①	4A07 ①	① Parallel and Phase
SP2	4"	PM	3-4Ω	49-809 ①	4A07 ①	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		ZENITH PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loop Ant.	S-40122					Includes Cabinet Back
L2	Osc. Coil	S-24700	14-1040	BC-393	71-Osc		
L3	Input IF	95-1504	16-6780	BC-356	13-PC1	RF-4	
L4	Output IF	95-1556			13-PC6		

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M1	Tuning Cap.	22-2895	2 Gang (Ant. 22-380mmf, Osc. 10-112mmf)
M2	Switch	85-495	Radio-Phono (Slide Type DPDT)

CABINETS & CABINET PARTS

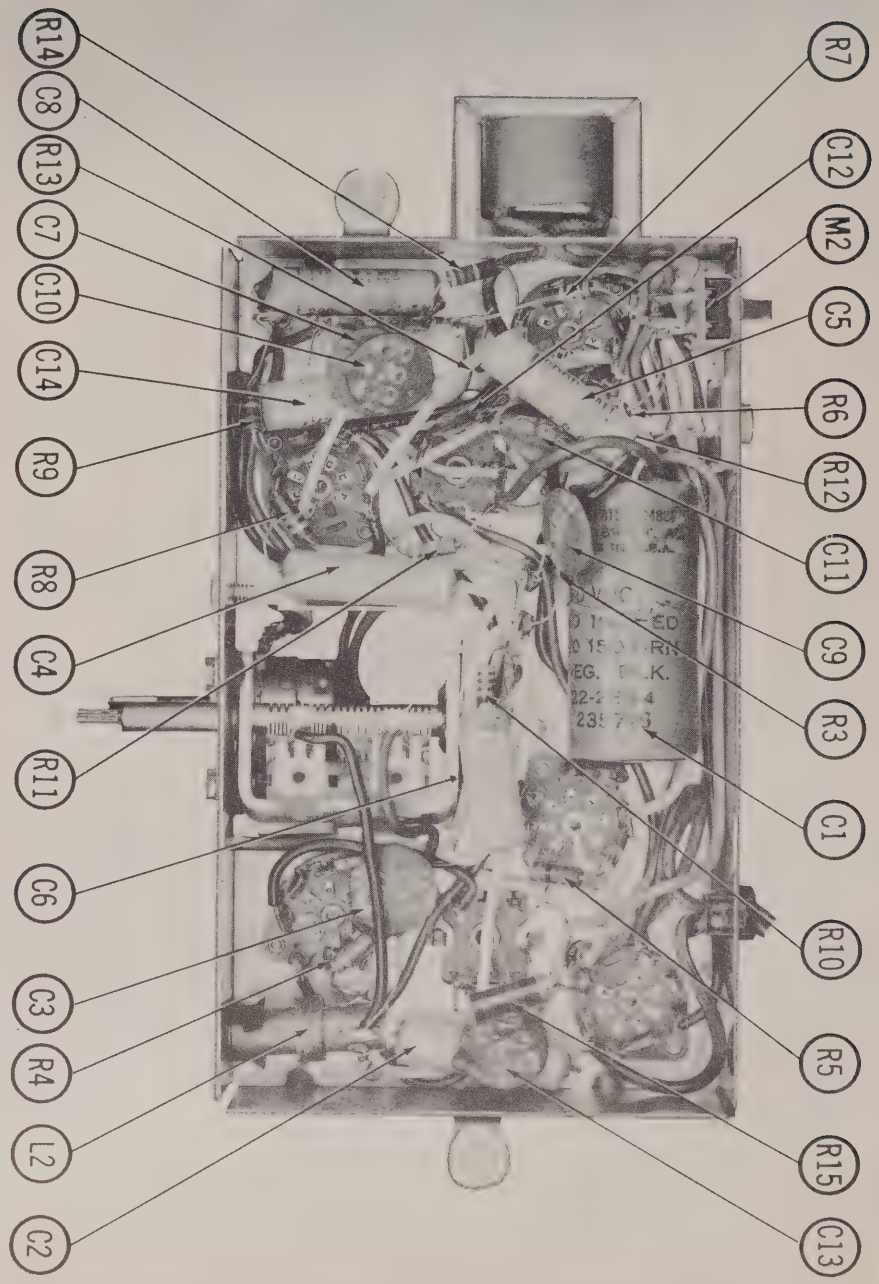
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

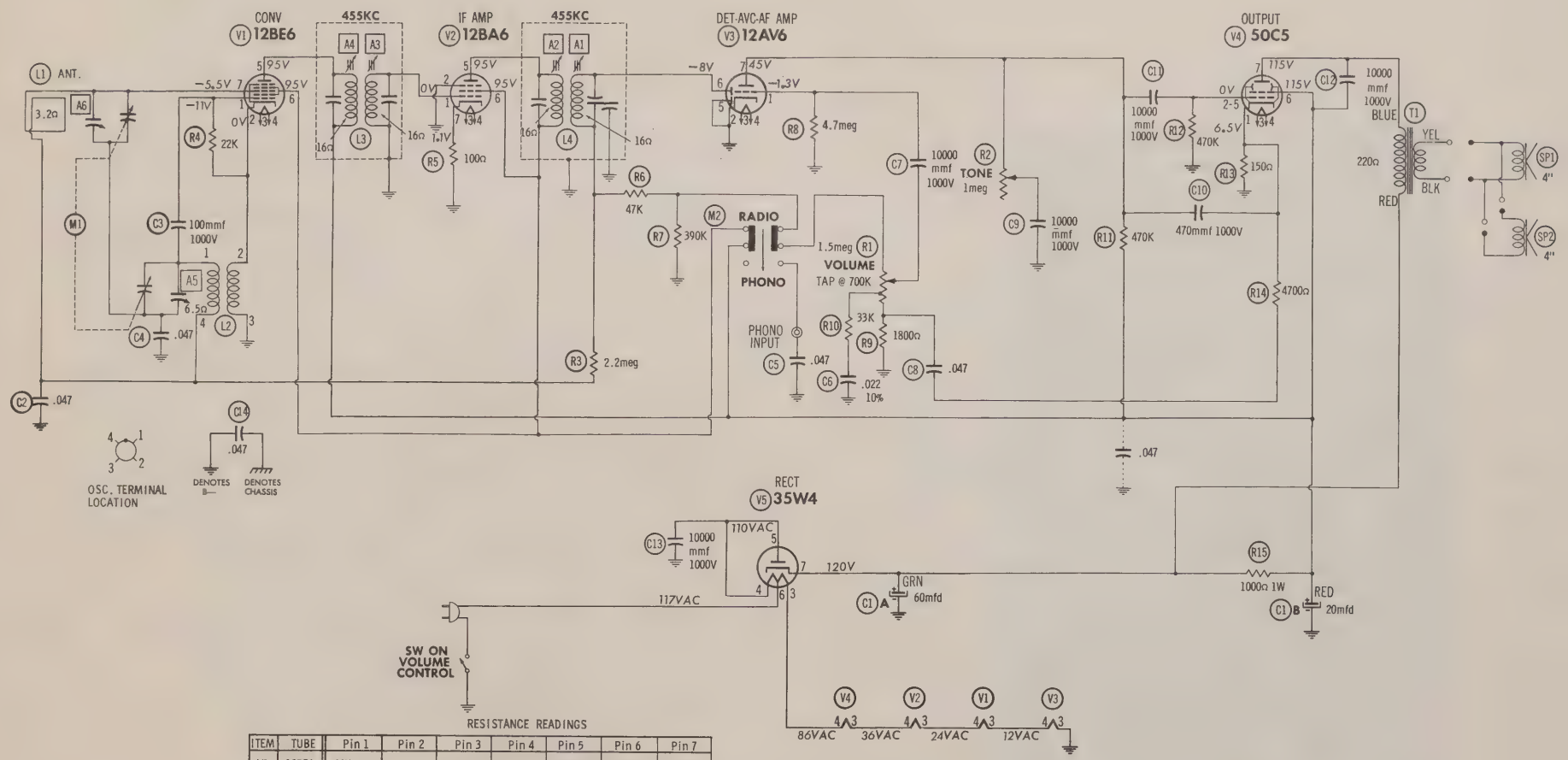
NAME	PART NO.	DESCRIPTION
Knob	46-1591	On-Off-Volume
Knob	46-1609	Tuning
Knob	46-1605	Dial, Model A512Y
Knob	46-1607	Dial, Model A512W
Knob	46-1408	Tone, Model A512Y
Knob	46-1820	Tone, Model A512W
Cabinet	14-2234	Model A512Y
Cabinet	14-2235	Model A512W

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.6Ω	12Ω	24Ω	†1000Ω	†1000Ω	2.6meg
V2	12BA6	16Ω	0Ω	24Ω	36Ω	†1000Ω	†1000Ω	100Ω
V3	12AV6	4.7meg	0Ω	0Ω	12Ω	0Ω	435K	†470K
V4	50C5	150Ω	470K	36Ω	86Ω	470K	†1000Ω	†220Ω
V5	35W4	TP	NC	86Ω	110Ω	110Ω	105Ω	20K(MIN)

† MEASURED FROM PIN 7 OF V5
NC NO CONNECTION
TP TIE POINT

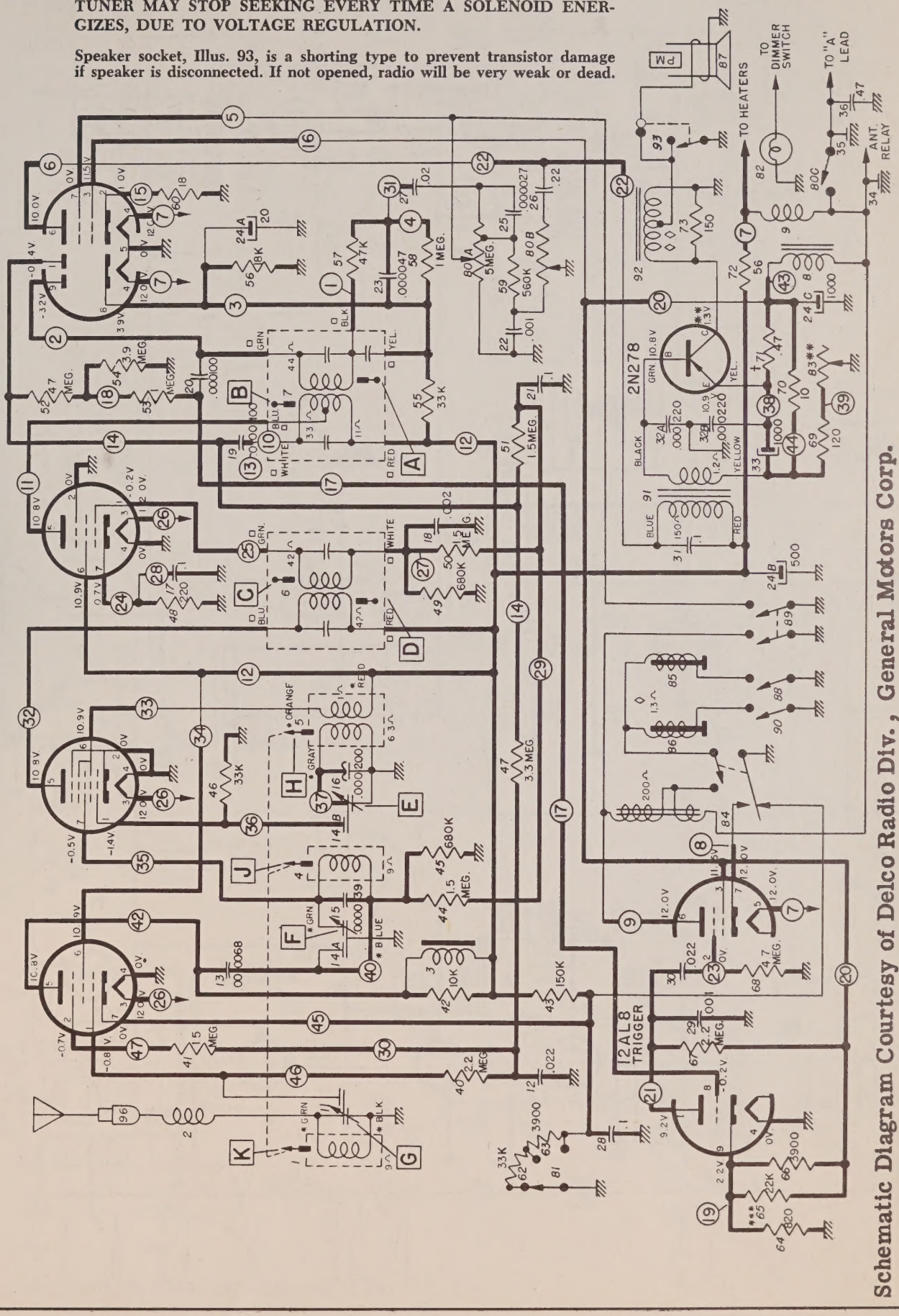
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to commom negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

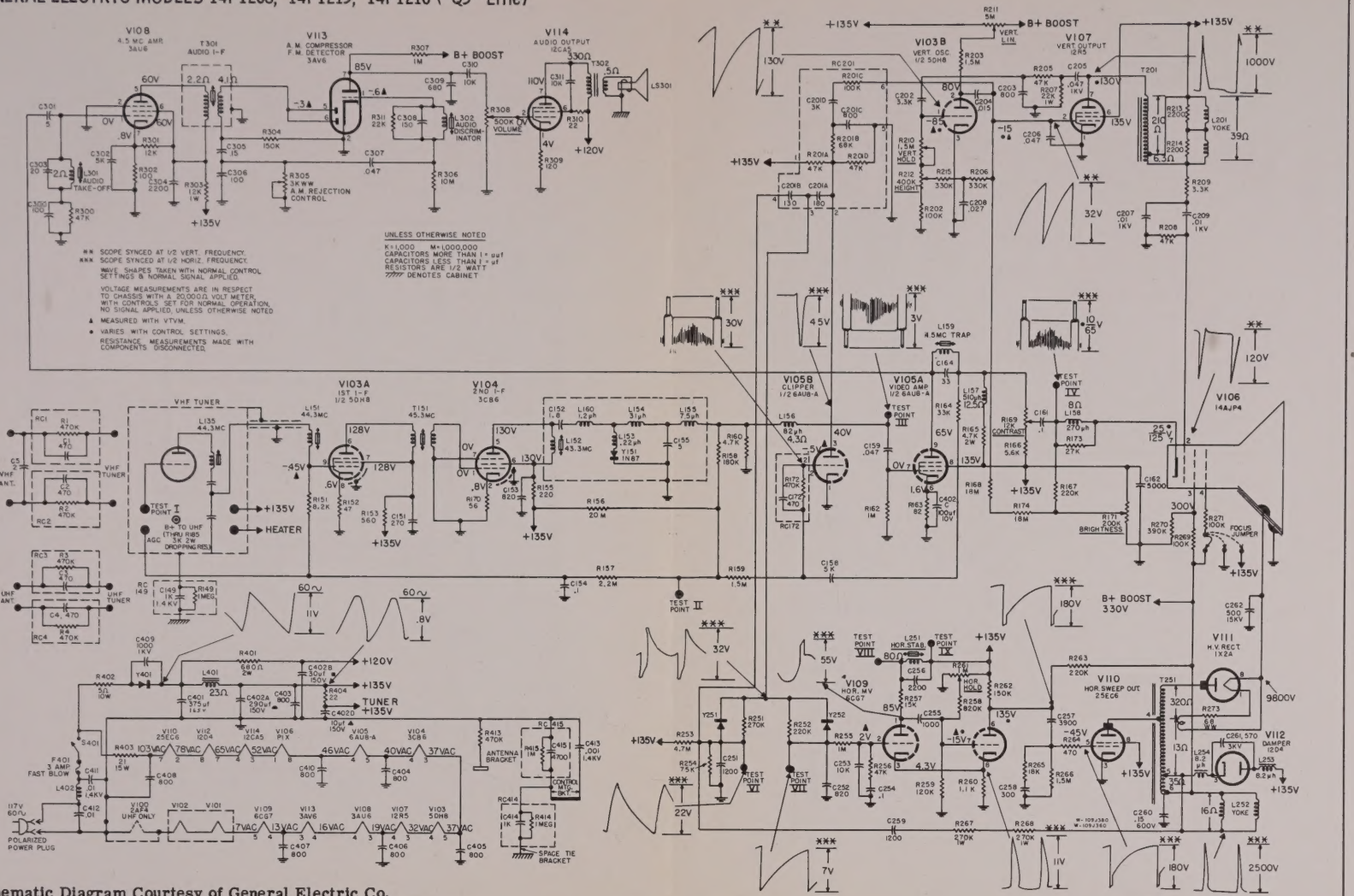
WHEN RADIO IS OPERATED ON BATTERY ELIMINATOR, THE TUNER MAY STOP SEEKING EVERY TIME A SOLENOID ENERGIZES, DUE TO VOLTAGE REGULATION.

Speaker socket, Illus. 93, is a shorting type to prevent transistor damage if speaker is disconnected. If not opened, radio will be very weak or dead.



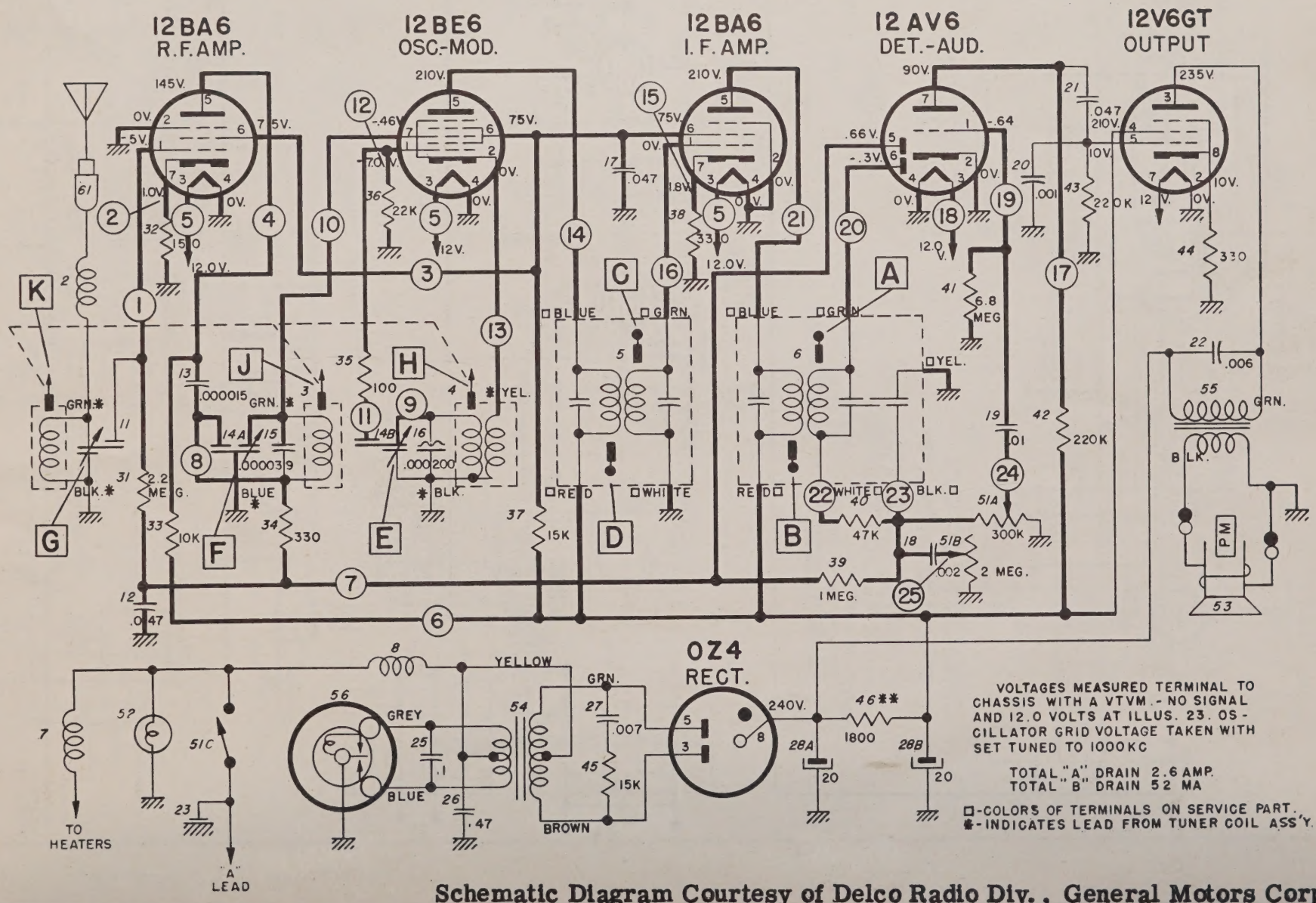
Schematic Diagram Courtesy of Delco Radio Div., General Motors Corp.

GENERAL ELECTRIC MODELS 14P1208, 14P1215, 14P1216 ("Q3" Line)



Schematic Diagram Courtesy of General Electric Co.

STUDEBAKER MODEL AC-2905



Schematic Diagram Courtesy of Delco Radio Div., General Motors Corp.